



# COUNTY OF LOS ANGELES

## DEPARTMENT OF PUBLIC WORKS

*"To Enrich Lives Through Effective and Caring Service"*

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July 29, 2008

IN REPLY PLEASE

REFER TO FILE: **WW-2**

The Honorable Board of Supervisors  
County of Los Angeles  
383 Kenneth Hahn Hall of Administration  
500 West Temple Street  
Los Angeles, CA 90012

Dear Supervisors:

**LOS ANGELES COUNTY WATERWORKS DISTRICT  
NO. 40, ANTELOPE VALLEY, REGION 4, LANCASTER  
NEGATIVE DECLARATION AND AUTHORIZATION TO PROCEED  
AVENUE K TRANSMISSION WATER MAIN PROJECT, PHASES I-IV  
(SUPERVISORIAL DISTRICT 5)  
(3 VOTES)**

**SUBJECT**

This action is to approve a Negative Declaration prepared for the Avenue K Transmission Water Main project (Phases I through IV) in the Antelope Valley and a request for authorization to proceed with the project.

**IT IS RECOMMENDED THAT YOUR BOARD ACTING AS THE GOVERNING BODY OF THE LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 40, ANTELOPE VALLEY:**

1. Consider the Negative Declaration, together with the comments received during the public review period, for the installation of approximately 32,000 linear feet of 30- to 36-inch-diameter steel water main along Avenue K from 30th Street East to 30th Street West in the City of Lancaster, estimated at a total cost of \$15,000,000; find that the project will not have a significant impact on the environment; find that the Negative Declaration reflects the independent judgment and analysis of the County; and approve the Negative Declaration for this project.

2. Find that the project will have no adverse effect on wildlife resources, and authorize the Department of Public Works to complete and file a Certificate of Fee Exemption with the California Department of Fish and Game for the project.
3. Approve the project and authorize the County of Los Angeles Department of Public Works to carry out the project in four phases.

### **PURPOSE/JUSTIFICATION OF RECOMMENDED ACTION**

The purpose of this action is to allow the Department of Public Works to install approximately 32,000 linear feet of 30- to 36-inch-diameter steel water main along Avenue K from 30th Street East to 30th Street West in the City of Lancaster. This project would be constructed in four phases from Fiscal Year 2008-09 to Fiscal Year 2012-13. Phase I will involve installation of a 36-inch steel water main between 5th Street East and 10th Street West; Phase II, a 36-inch water main between 5th Street East and 20th Street East; Phase III, a 30-inch water main between 10th Street West and 30th Street West; and Phase IV, a 36-inch water main between 20th Street East and 30th Street East. The proposed transmission water main would increase the water service reliability in the City of Lancaster.

This project was recommended in the latest Master Plan of Water Facilities prepared for the Los Angeles County Waterworks District No. 40, Antelope Valley, Region 4 (District). The project would prevent large pressure fluctuations within the existing water supply system and improve the District's ability to efficiently utilize available State Water Project water from the Antelope Valley-East Kern Water Agency.

### **Implementation of Strategic Plan Goals**

The Countywide Strategic Plan directs that we provide Service Excellence (Goal 1) and Community Services (Goal 6). The recommended action will help fulfill these goals by improving the water service reliability for the District's customers in the City of Lancaster.

### **FISCAL IMPACT/FINANCING**

There will be no negative impact on the County General Fund.

The estimated construction cost to complete all four phases of this project is approximately \$15,000,000.

Sufficient funds to cover the cost of the four phases of this project are included in the District's Accumulated Capital Outlay Fund (N64) budget for Fiscal Year 2008-09 to Fiscal Year 2012-13.

### **FACTS AND PROVISIONS/LEGAL REQUIREMENTS**

On October 3, 2000, your Board adopted our recommendation to execute a consultant services agreement with Brockmeier Consulting Engineers, Inc., to provide design plans, specifications, and engineering estimates for all four phases of the project.

Under the California Environmental Quality Act (CEQA), any lead agency preparing a Negative Declaration must provide a public notice within a reasonable period of time prior to certification of the Negative Declaration. To comply with this requirement and pursuant to Section 21092 of the Public Resources Code, a public notice was published in the *Los Angeles Times* and in the *Antelope Valley Press* on November 29, 2007. A copy of the draft Negative Declaration was provided to the Lancaster Regional Library and the Palmdale City Library for public review. In addition, copies of the draft Negative Declaration were sent to the agencies listed in Exhibit G of the attached Negative Declaration.

The 30-day public review period ended on December 27, 2007. We responded to comments we received from the California Regional Water Quality Control Board, the Native American Heritage Commission, the California Department of Public Health, and the City of Lancaster. Copies of our responses to these agencies are included in Exhibit H of the attached Negative Declaration.

### **ENVIRONMENTAL DOCUMENTATION**

The CEQA requires public agency decision makers to document and consider environmental implications of their actions. The Negative Declaration was written pursuant to the CEQA Guidelines of 1970 as amended (Division 13, California Public Resources Code) and the CEQA Guidelines (Division 6, California Administrative Code).

Upon approval of the Negative Declaration by your Board, we will file a Notice of Determination in accordance with the requirements of Section 21152(a) of the California Public Resources Code.

The Honorable Board of Supervisors  
July 29, 2008  
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### **CONTRACTING PROCESS**

The four phases of this project will be contracted on an open-competitive bid basis. The contracts will be awarded to the lowest responsible bidder, meeting the criteria established by your Board and the California Public Contract Code, and will be submitted to your Board for approval.

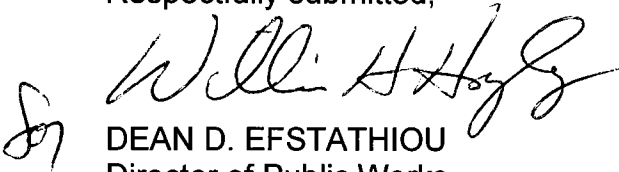
### **IMPACT ON CURRENT SERVICES (OR PROJECTS)**

Approval of this Negative Declaration will enable the District to go forward with the construction of the proposed waterline and enhance the reliability of water service to the District's customers in the region. There will be no negative impact on current County services or projects during the performance of the recommended contracts.

### **CONCLUSION**

Please return one adopted copy of this letter to the Department of Public Works, Waterworks Division.

Respectfully submitted,

  
DEAN D. EFSTATHIOU  
Director of Public Works

AA:ea

Attachment

c: Chief Executive Office



## **PROPOSED NEGATIVE DECLARATION**

### **COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 40, ANTELOPE VALLEY, REGION NO. 4, LANCASTER**

#### **PROPOSED AVENUE K TRANSMISSION WATER MAIN**

1. **Location and Brief Description**

The proposed project is located in the Los Angeles County Waterworks District No. 40, Antelope Valley, Region No. 4, Lancaster (District), along Avenue K as shown on Exhibit A. The proposed project consists of installing approximately 32,000 linear feet of 30- to 36-inch-diameter transmission water main along Avenue K from 30th Street East to 30th Street West (See Exhibit B). The purpose of the proposed water main is to increase the capacity of the Lancaster water system to meet the current domestic and fire protection water demands. The project will be constructed in four separate phases as shown on Exhibit C. Phase I consists of installing a new 36-inch steel water main on Avenue K between 5th Street East and 10th Street West. In Phase II, the 36-inch main will be extended from 5<sup>th</sup> Street East to the existing 48-inch main on 20th Street East. During Phase III, a 30-inch main will be installed from 10th Street West to 30th Street West. In Phase IV, the 36-inch water main will be extended from 20<sup>th</sup> Street East to 30<sup>th</sup> Street East. ✧

2. **Mitigation Measures Included in the Project to Avoid Potentially Significant Effects**

No mitigation measures are included as no significant negative impacts on the environment were identified by the attached Initial Study.

3. **Finding of No Significant Effect**

Based on the attached Initial Study, it has been determined that the project will not have a significant effect on the environment.

Attach.

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## **INITIAL STUDY OF ENVIRONMENTAL FACTORS**

### **COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 40, ANTELOPE VALLEY, REGION NO. 4, LANCASTER**

#### **PROPOSED AVENUE K TRANSMISSION WATER MAIN**

1. **Project Title**

Avenue K Transmission Water Main

2. **Lead Agency Name and Address**

Los Angeles County Department of Public Works  
Waterworks Division  
P.O. Box 1460  
Alhambra, CA 91802-1460

3. **Contact Person and Phone Number**

Michael Ignatius - (626) 300-3396

4. **Project Location**

The proposed project is located in the Los Angeles County Waterworks District No. 40, Antelope Valley, Region No. 4 Lancaster, along Avenue K, in the City of Lancaster, as shown on Exhibit A.

5. **Project Sponsors Name and Address**

Los Angeles County Department of Public Works  
Waterworks Division  
P.O. Box 1460  
Alhambra, CA 91802-1460

6. **General Plan Designation**

Residential and Retail/Commercial

7. **Zoning**

Commercial interspersed with residential areas



8. Description of Project

The proposed project consists of installing approximately 32,000 linear feet of 30- to 36-inch-diameter transmission water main along Avenue K from 30th Street East to 30th Street West (See Exhibit B). The purpose of the proposed water main is to increase the capacity of the Lancaster water system to meet the current domestic and fire protection water demands. The project will be constructed in four separate phases as shown on Exhibit C. Phase I consists of installing a new 36-inch steel water main on Avenue K between 5th Street East and 10th Street West. In Phase II, the 36-inch main will be extended from 5<sup>th</sup> Street East to the existing 48-inch main on 20th Street East. During Phase III, a 30-inch main will be installed from 10th Street West to 30th Street West. In Phase IV, the 36-inch water main will be extended from 20<sup>th</sup> Street East to 30<sup>th</sup> Street East.

9. Surrounding Land Uses and Environmental Setting

- A) Project Site – The project site is a paved road which will require trenching and boring and jacking during pipeline construction.
- B) Surrounding Properties – The surrounding area is mostly commercial interspersed with residential areas and schools.

10. Other Agencies Whose Approval is Required (and Permits Needed)

- 1. City of Lancaster - Encroachment Permit
- 2. California Department of Transportation (Caltrans)
- 3. Metropolitan Transportation Authority (MTA)
- 4. Union Pacific Railroad Company (UPRR)



## ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" or "Potentially Significant Unless Mitigated," as indicated by the checklist on the following pages.

<input type="checkbox"/> Aesthetics	<input type="checkbox"/> Agriculture Resources	<input type="checkbox"/> Air Quality
<input type="checkbox"/> Biological Resources	<input type="checkbox"/> Cultural Resources	<input type="checkbox"/> Geology/Soils
<input type="checkbox"/> Hazards & Hazardous Materials	<input type="checkbox"/> Hydrology/Water Quality	<input type="checkbox"/> Land Use/Planning
<input type="checkbox"/> Mineral Resources	<input type="checkbox"/> Noise	<input type="checkbox"/> Population/Housing
<input type="checkbox"/> Public Services	<input type="checkbox"/> Recreation	<input type="checkbox"/> Transportation / Traffic
<input type="checkbox"/> Utilities/Service Systems	<input type="checkbox"/> Mandatory Findings of Significance	

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

☒ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project would have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature

MICHAEL IGNATIUS

Printed Name

Date

LACDPW

For

## **EVALUATION OF ENVIRONMENTAL IMPACTS**

### **AVENUE K TRANSMISSION WATER MAIN**

1. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants based on a project-specific screening analysis).
2. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project level, indirect as well as direct, and construction as well as operational impacts.
3. "Potential Significant Impact" is appropriate if an effect is significant or potentially significant, or if the lead agency lacks information to make a finding of insignificance. If there are one or more "Potential Significant Impact" entries when the determination is made, an Environmental Impact Report is required.
4. "Less Than Significant With Mitigation Incorporation" applies where the incorporation of mitigation measures has reduced an effect from "Potential Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVIII, "Earlier Analysis," may be cross-referenced).
5. Earlier analyses may be used where, pursuant to the tiering, program Environmental Impact Report, or other California Environmental Quality Act process, an effect has been adequately analyzed in an earlier Environmental Impact Report or Negative Declaration. Section 15063(c)(3)(D). Earlier analyses are discussed in Section XVIII at the end of the checklist.
6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). See the sample question below. A source list should be attached and other sources used or individuals contacted should be cited in the discussion.

**ENVIRONMENTAL CHECKLIST FORM**

**AVENUE K TRANSMISSION WATER MAIN**

		Potential Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>I. <u>AESTHETICS</u> - Would the project:</b>					
	a)	Have a substantial adverse effect on a scenic vista?			X
	b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcrops, and historic buildings within a State scenic highway?			X
	c)	Substantially degrade the existing visual character or quality of the site and its surroundings?		X	
	d)	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?			X
<b>II. <u>AGRICULTURE RESOURCES</u> - In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:</b>					
	a)	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use?			X
	b)	Conflict with existing zoning for agricultural use or a Williamson Act contract?			X
	c)	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to nonagricultural use?			X
<b>III. <u>AIR QUALITY</u> - Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:</b>					
	a)	Conflict with or obstruct implementation of the applicable air quality plan?			X
	b)	Violate any air quality standard or contribute substantially to an existing or projected air quality violation?		X	
	c)	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for zone precursors)?			X
	d)	Expose sensitive receptors to substantial pollutant concentrations?		X	
	e)	Create objectionable odors affecting a substantial number of people?		X	

			Potential Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>IV. <u>BIOLOGICAL RESOURCES</u> - Would the project:</b>						
	a)	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?				X
	b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?				X
	c)	Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?				X
	d)	Interfere substantially with the movement of any native resident, migratory fish, or wildlife species; or with established native resident or migratory wildlife corridors; or impede the use of native wildlife nursery sites?				X
	e)	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
	f)	Conflict with the provisions of an adopted Habitat Conservation Plan; Natural Community Conservation Plan; or other approved local, regional, or State habitat conservation plan?				X
<b>V. <u>CULTURAL RESOURCES</u> - Would the project:</b>						
	a)	Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?				X
	b)	Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?				X
	c)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?				X
	d)	Disturb any human remains, including those interred outside of formal cemeteries?				X
<b>VI. <u>GEOLOGY AND SOILS</u> - Would the project:</b>						
	a)	Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				



			Potential Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
		i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State geologist for the area or based on other substantial evidence of a know fault? Refer to Division of Mines and Geology Special Publication 42.				X
		ii) Strong seismic ground shaking?			X	
		iii) Seismic-related ground failure, including liquefaction?			X	
		iv) Landslides?				X
	b)	Result in substantial soil erosion or the loss of topsoil?				X
	c)	Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?			X	
	d)	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				X
	e)	Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?				X

**VII. HAZARDS AND HAZARDOUS MATERIALS - Would the project:**

	a)	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?				X
	b)	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			X	
	c)	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			X	
	d)	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code, Section 65962.5, and, as a result, would it create a significant hazard to the public or the environment?				X
	e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				X
	f)	For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X

			Potential Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
	g)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
	h)	Expose people or structures to a significant risk of loss, injury, or death involving wild land fires, including where wild lands are adjacent to urbanized areas or where residences are intermixed with wild lands?				X
<b>VIII. HYDROLOGY AND WATER QUALITY - Would the project:</b>						
	a)	Violate any water quality standards or waste discharge requirements?				X
	b)	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				X
	c)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?				X
	d)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?				X
	e)	Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?				X
	f)	Otherwise substantially degrade water quality?				X
	g)	Place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X
	h)	Place within a 100-year flood hazard area structures which would impede or redirect flood flows?				X
	i)	Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?				X
	j)	Inundation by seiche, tsunami, or mudflow?				X
<b>IX. LAND USE AND PLANNING - Would the project:</b>						
	a)	Physically divide an established community?				X

			Potential Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
	b)	Conflict with any applicable land use plan, policy, or regulation of any agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				X
	c)	Conflict with any applicable habitat conservation plan or natural community conservation plan?				X
<b>X. MINERAL RESOURCES - Would the project:</b>						
	a)	Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?				X
	b)	Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?				X
<b>XI. NOISE - Would the project result in:</b>						
	a)	Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or ordinance or applicable standards of other agencies?			X	
	b)	Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?			X	
	c)	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			X	
	d)	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?			X	
	e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				X
	f)	For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				X
<b>XII. POPULATION AND HOUSING - Would the project:</b>						
	a)	Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?				X
	b)	Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
	c)	Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X

		Potential Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>XIII. PUBLIC SERVICES</b>					
a)	Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities; need for new or physically altered governmental facilities; the construction of which could cause significant environmental impacts in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
	Fire protection?				X
	Police protection?				X
	Schools?				X
	Parks?				X
	Other public facilities?				X
<b>XIV. RECREATION</b>					
a)	Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
b)	Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				X
<b>XV. TRANSPORTATION/TRAFFIC - Would the project:</b>					
a)	Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?			X	
b)	Exceed, either individually or cumulatively, a level of service standard established by the County Congestion Management Agency for designated roads or highways?				X
c)	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				X
d)	Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X
e)	Result in inadequate emergency access?			X	
f)	Result in inadequate parking capacity?			X	
g)	Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?			X	

		Potential Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
<b>XVI. UTILITIES AND SERVICE SYSTEMS - Would the project:</b>					
a)	Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				X
b)	Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
c)	Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
d)	Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				X
e)	Result in a determination by the wastewater treatment provider, which serves or may serve the project, that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				X
f)	Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?				X
g)	Comply with Federal, State, and local statutes and regulations related to solid waste?				X
<b>XVII. MANDATORY FINDINGS OF SIGNIFICANCE</b>					
a)	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?				X
b)	Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)				X
c)	Does the project have environmental effects which will cause substantial adverse effects on human beings either directly or indirectly?				X
<b>XVIII. DISCUSSION OF WAYS TO MITIGATE SIGNIFICANT EFFECTS</b>					
No mitigation measures are included as no significant environmental effects were identified by the initial study.					

## DISCUSSION OF ENVIRONMENTAL FACTORS

### AVENUE K TRANSMISSION WATER MAIN

#### I. AESTHETICS - Would the project:

a) **Have a substantial adverse effect on a scenic vista?**

**No impact.** The proposed water main will not be constructed in or near designated scenic vistas. Therefore, the project will not result in adverse impacts on any scenic vistas.

b) **Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?**

**No impact.** The construction of the proposed project is not within any State scenic highway and thus will have no impact on scenic resources, trees, rock outcroppings, or historical buildings within a State scenic highway.

c) **Substantially degrade the existing visual character or quality of the site and its surroundings?**

**Less than significant impact.** The proposed water main will be constructed below ground near the centerline of Avenue K, with exceptions of minor portions such as fire hydrants and air release and vacuum valves that will be above ground and will be painted with gloss enamel paint for operation and identification purposes. The proposed project will have a less than significant impact to substantially degrade the existing visual character or quality of the site and its surroundings.

d) **Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?**

**No impact.** The proposed project will not include additional lighting systems or propose structures that could result in glare. Therefore, the proposed project will have no impact on day or nighttime views in the area.

#### II. AGRICULTURE RESOURCES - In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:

a) **Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use?**

**No impact.** The proposed project location is not used for agricultural purposes or as farmland. Therefore, the project will not convert any farmland to nonagricultural use.

**b) Conflict with existing zoning for agricultural use or a Williamson Act contract?**

**No impact.** There is no active agriculture and no Williamson Act contract in the project area. Thus, the proposed project will not impact any existing zoning for agricultural uses or a Williamson Act contract.

**c) Involve other changes in the existing environment, which due to their location or nature, could result in conversion of Farmland to nonagricultural use?**

**No impact.** The proposed project area consists of mainly commercial and some residential developments. The project area does not currently have farmland resources and, therefore, will not convert any farmland to nonagricultural use.

**III. AIR QUALITY - Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:**

**a) Conflict with or obstruct implementation of the applicable air quality plan?**

**No impact.** The County of Los Angeles Department of Public Works currently complies with dust control measures enforced by the Antelope Valley Air Quality Management District and the Air Quality Management Plan. The proposed project will not conflict with current implementation of the applicable air quality plan.

**b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?**

**Less than significant impact.** The proposed project will have no effect upon air quality, however, construction activities may have temporary short-term impacts. The project specifications require construction contractors to equip all machinery and equipment with suitable air pollution control devices and to use dust control measures such as sweeping and/or watering to control dust emissions created by construction activity, thereby further limiting potential impacts. When transporting excess excavated material, the contractor will be required to cover material with a tarp to reduce dust emissions and prevent falling debris. The impact is considered to be less than significant since the exposure will be temporary and precautions will be taken to minimize impact to air quality.

- c) **Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?**

**No impact.** Project specifications will require the contractor to comply with all Federal and State emission control regulations. The proposed project construction will not lead to emissions which exceed thresholds for ozone precursors. Therefore, the proposed project will have no impact on ambient air quality standards.

- d) **Expose sensitive receptors to substantial pollutant concentrations?**

**Less than significant impact.** Sensitive receptors in the area may be subjected to dust and construction equipment emission during project construction. Project specifications will require the contractor to control dust by appropriate means such as sweeping and/or watering and comply with all applicable air pollution control regulations. The impact is considered to be less than significant since the exposure will be temporary and precautions will be taken to minimize exposure to pollutants.

- e) **Create objectionable odors affecting a substantial number of people?**

**Less than significant impact.** Objectionable odors may be generated from operating various equipment during construction activities. These types of odors will be short-term and temporary. Thus, the impact of creating objectionable odor is considered less than significant.

#### **IV. BIOLOGICAL RESOURCES - Would the project:**

- a) **Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?**

**No impact.** The construction of the proposed water main will be in a paved road within a densely developed community. There are no known sensitive or special status species within the project limits. Thus, the proposed project will have no impact on sensitive or special status species or their respective habitat.

- b) **Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?**

**No impact.** See IV. a.



- c) **Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?**

**No impact.** The proposed facilities will be constructed within the improved road right of way and will not affect any federally protected wetland habitat. Therefore, the proposed project will not impact wetland habitat.

- d) **Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?**

**No impact.** See IV. a.

- e) **Conflict with any local policies or ordinances protecting biological resources such as a tree preservation policy or ordinance?**

**No impact.** The proposed project will not be affecting any known locally protected biological resources. Therefore, the proposed project will not conflict with any local policies or ordinances protecting biological resources.

- f) **Conflict with the provisions of an adopted Habitat Conservation Plan; Natural Community Conservation Plan; or other approved local, regional, or State Habitat Conservation Plan?**

**No impact.** The proposed project will not be affecting any known adopted habitat conservation plan or natural community conservation. Therefore, the proposed project will have no impact on any of these plans.

**V. CULTURAL RESOURCES - Would the project:**

- a-d) **Cause a substantial adverse change in the significance of a historical or archaeological resource as defined in Section 15064.5; directly or indirectly destroy a unique paleontological resource, site, or unique geologic feature; or disturb any human remains, including those interred outside formal cemeteries?**

**No impact.** A record search, "Quick Check", conducted by the UCLA Regional Archaeological Information Center noted that there are known archaeological sites located within one-half mile of the project site (see Exhibit "E"). A Phase 1 survey was undertaken of the project site, which yielded no evidence of archaeological materials or features in the project area. However, in the event that resources are encountered during construction, all construction activities placing such materials at risk must cease until proper examination by a qualified Archaeologist. In case human remains or any cultural resources are identified during the course of construction, all construction activities in the vicinity of the discovery will be halted and the Los Angeles County Coroner will be notified. No work will

be initiated until the issue has been properly addressed. Therefore, the proposed project will have a less than significant impact on these resources.

**VI. GEOLOGY AND SOILS - Would the project:**

**a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:**

**i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.**

**No impact.** According to a Geotechnical Engineering Report prepared by Earth Systems, dated February 9, 2001 (See Exhibit "F"), the water main alignment does not cross any known active faults. The nearest active fault is the San Andreas fault located approximately six miles from the project alignment. The proposed project does not include the construction of any facilities that are intended for human occupancy nor will any facilities be constructed in areas associated with geologic problems such as Alquist-Priolo Earthquake Zones which are defined by the California State Division of Mines and Geology to delineate known active or potentially active faults. Therefore, rupture of earthquake faults will not impact the proposed project.

**ii) Strong seismic ground shaking?**

**Less than significant impact.** Although the project area has not been the epicenter of any known earthquake, the water main alignment, like most of southern California, will be subject to ground shaking during major earthquakes. However, the project does not include the construction of any facilities that are intended for human occupancy. In addition, the water main will be manufactured from steel materials that meet the current design criteria set forth by the Los Angeles County Waterworks Districts and American Waterworks Association. Therefore, the proposed project will have a less than significant impact related to seismic ground shaking.

**iii) Seismic-related ground failure, including liquefaction?**

**Less than significant impact.** The proposed project is to be constructed near the centerline of the existing well-compacted and paved road. The trench excavation will be backfilled with a minimum relative compaction of 90 percent to give additional support to the water main. According to a geotechnical engineering report prepared in February 9, 2001, by Earth Systems, the static water level in the project area is greater than 50 feet below ground surface and is not

considered a risk factor for liquefaction. Therefore, there is a less than significant factor to seismic-related ground failure, including liquefaction.

**iv) Landslides?**

**No impact.** The project area is flat and is not within a State designated Seismic Hazard Zone for Earthquake-induced Landslides. Therefore, there is no impact from landslides.

**b) Result in substantial soil erosion or the loss of topsoil?**

**No impact.** The proposed project excavation will be within the improved street right of way and will be repaved in kind. Therefore, the proposed project will have no impact on the loss of topsoil or soil erosion.

**c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?**

**Less than significant impact.** See section VI.a (ii-iv)

**d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?**

**No impact.** According to the geotechnical investigation report, there are no expansive soils found in the project area. Therefore, the proposed project will have no impact on creating substantial risks to life or property.

**e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?**

**No impact.** All existing wastewater disposal systems will remain intact and there are no new septic facilities proposed at the project site. Therefore, the project will have no impact on the use of septic tanks or alternative wastewater disposal systems.

**VII. HAZARDS AND HAZARDOUS MATERIALS - Would the project:**

**a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?**

**No impact.** The proposed project does not involve the routine transport, use, or disposal of hazardous materials. Therefore, the project will have no impact on the transport, use, or disposal of hazardous materials.

- b-c) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment or emit hazardous emissions or handle hazardous materials, substances, or wastes within one-quarter mile of an existing or proposed school?**

**Less than significant impact.** Necessary precautions will be taken to prevent the spillage of any hazardous substances that may affect the public or the environment at the project site. It is unlikely that an explosion, emission, or release of hazardous or acutely hazardous substances will occur as a result of the proposed project. Project specifications will require the contractor to properly maintain all equipment during construction per the Best Management Practices requirements. In the event of any spills of fluids, the contractor is required to remediate according to all applicable laws regarding chemical cleanup and the nearby school officials will be notified of the spill and any precautions to be taken. Thus, the proposed project impact on the public or environment is considered less than significant.

- d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code, Section 65962.5, and, as a result, would it create a significant hazard to the public or the environment?**

**No impact.** The project site is not known to be a hazardous materials site. Therefore, the proposed project will not create a significant hazard to the public or the environment.

- e) For a project located within an airport land use plan or where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?**

**No impact.** The proposed project area is not within an airport land use plan or where such a plan has not been adopted within two miles of a public airport or public use airport. Therefore, the proposed project will have no impact relating to the safety hazards for people working in the project area.

- f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?**

**No impact.** The proposed project is not located within the vicinity of a private airstrip. Thus, the proposed project will have no impact relating to a safety hazard for people residing or working in the project area.

- g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?**

**No impact.** The proposed project will result in a short-term increase in the number of vehicle trips over the course of construction as a result of construction traffic. The construction contractor will be required by Los Angeles County Department of Public Works' standard contract documents to provide adequate and safe traffic control measures, including adequate access to adjacent properties that will both accommodate local traffic and ensure the safety of travelers within the project area. Therefore, the project will not impact or interfere with any adopted emergency response or evacuation plans.

- h) **Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?**

**No impact.** The proposed project is located in a developed commercial and residential area. Therefore, the proposed project is not expected to result in adverse impacts related to wildland fires.

**VIII. HYDROLOGY AND WATER QUALITY - Would the project:**

- a) **Violate any water quality standards or waste discharge requirements?**

**No impact.** The contractor is required to implement Best Management Practices to minimize construction impacts on water quality. Therefore, the project will have no impact on the water quality standards or waste discharge requirements.

- b) **Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?**

**No impact.** The proposed project will not result in the use of any water that will result in a net deficit in aquifer volume or a lowering of the groundwater table. Therefore, no impacts to groundwater supplies or groundwater recharge are anticipated to occur.

- c-d) **Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?**

**No impact.** The construction of the water main will not alter the present drainage pattern of the project site. Therefore, the proposed project will

have no impact on erosion, siltation, or on the rate or amount of surface runoff.

- e) **Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?**

**No impact.** The construction of the project will not result in additional surface water runoff. Thus, the impact of the proposed project on the existing or planned storm water drainage systems is not expected to have adverse affects.

- f) **Otherwise substantially degrade water quality?**

**No impact.** The contractor will adhere to applicable Best Management Practices to minimize any degradation to water quality during construction. Therefore, the proposed project will not impact or degrade water quality.

- g) **Place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?**

**No impact.** The proposed project will not place any housing within a 100-year flood hazard area.

- h) **Place within a 100-year flood hazard area structures which would impede or redirect flood flows?**

**No impact.** The proposed project will not place any structures within a 100-year flood hazard area which may impede or redirect flood flows.

- i) **Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?**

**No impact.** The proposed project will not expose people or structures to a significant risk of loss, injury, or death involving flooding.

- j) **Inundation by seiche, tsunami, or mudflow?**

**No impact.** The project site is located in a flat area of City of Lancaster and will not be subjected any inundation by seiche, tsunami, or mudflow.

**IX. LAND USE AND PLANNING - Would the project:**

- a) **Physically divide an established community?**

**No impact.** The proposed project does not include the construction of any facilities that would physically divide the community. Therefore, the project will have no impact on physically dividing an established community.

- b) **Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?**

**No impact.** The project alignment will bore and jack under the existing MTA and URR railroad tracks east of Sierra Highway for which Right of Entry permits have been issued. The proposed project does not impact or conflict with any known applicable land use plan, policy, or regulation of any of the agencies with jurisdiction.

- c) **Conflict with any applicable habitat conservation plan or natural community conservation plan?**

**No impact.** The proposed project will not conflict with any known habitat conservation plan or natural community conservation plan adopted by any agency or community.

**X. MINERAL RESOURCES - Would the project :**

- a) **Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?**

**No impact.** The construction of the proposed project will not deplete any known mineral resources. Therefore, no impact is anticipated.

- b) **Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?**

**No impact.** The project site is not identified as a mineral resource recovery site in the local general plan, specific plan, or other land-use plan. Therefore, the proposed project will have no impact on locally important mineral resource recovery site.

**XI. NOISE - Would the project result in:**

- a) **Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?**

**Less than significant impact.** Noise levels within the proposed project site may increase during construction. However, the impact is temporary and will be subject to existing noise ordinances and standards set by the U.S. Occupational Safety and Health Administration. The contractor will be required to comply with the construction hours specified in the City of Lancaster noise control ordinances. Overall, since the construction period will last for a short period, the project will not expose people to severe noise

levels. Thus, the impact to severe noise levels is considered less than significant.

**b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?**

**Less than significant impact.** Excavation and compaction during construction could cause limited temporary ground vibration. However, the project specifications will require the contractor to comply with all noise laws and ordinances. The project groundborne vibration and noise will be considered less than significant since construction will be for a short period and will not expose people to severe noise levels.

**c-d) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project or a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?**

**Less than significant impact.** During the construction phase of the project, there will be some increase in existing noise levels. However, the proposed project contains no noise-generating features that will result in a permanent increase in ambient noise level. Due to the short-term nature of the project, the impact will be less than significant.

**e-f) For a project located within an airport land use plan or where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels or for a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?**

**No impact.** The proposed project area is not within an airport land-use plan or where such a plan has not been adopted within two miles of a public airport or public use airport. Therefore, the proposed project will have no impact relating to excessive noise levels.

**XII. POPULATION AND HOUSING - Would the project:**

**a) Induce substantial population growth in an area either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?**

**No impact.** The proposed project will provide an additional water supply to help meet the current domestic and fire protection demand. No new homes and businesses are proposed within this project. Therefore, construction of the proposed project is not expected to result in population growth in the area directly or indirectly.



- b-c) **Displace substantial numbers of people or existing housing, necessitating the construction of replacement housing elsewhere?**

**No impact.** The proposed project will not displace any existing residents or housing, which will create a demand for additional housing elsewhere.

### **XIII. PUBLIC SERVICE**

- a) **Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services: Fire protection, police protection, schools, parks, other public facilities?**

**No impact.** The proposed project will not affect public service and will not result in a need for new or altered governmental services in fire protection, police protection, schools, parks, or other public facilities.

### **XIV. RECREATION**

- a) **Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?**

**No impact.** The proposed project will not increase the use of existing neighborhood or regional parks.

- b) **Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?**

**No impact.** The proposed project does not include nor require the construction or expansion of any recreational facilities.

### **XV. TRANSPORTATION/TRAFFIC - Would the project:**

- a) **Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?**

**Less than significant impact.** The proposed project will result in a short-term increase in the number of vehicle trips as a result of construction traffic; however, the impact upon traffic congestion will not be significant.

- b) **Exceed, either individually or cumulatively, a level of service standard established by the County Congestion Management Agency for designated roads or highways?**

**No impact.** The increase in traffic in the project area due to construction vehicles is temporary. Overall, the proposed project will not directly or indirectly cause traffic to exceed a level of service standard established by the County Congestion Management Agency for roads or highways in the project area.

- c) **Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location, that results in substantial safety risks?**

**No impact.** The proposed project will have no impact on air traffic patterns.

- d) **Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?**

**No impact.** The proposed project does not involve any design features that are known to constitute safety hazards. Open excavations will be paved within the street right of way in accordance to the City of Lancaster's requirements. Therefore, the project will have no impact on hazards due to design features.

- e) **Result in inadequate emergency access?**

**Less than significant impact.** The construction activities may slow down traffic. However, the project specifications will require that emergency access be maintained at all times. The contractor will be required to give advance notice of all street and/or lane closures and detours to all emergency service agencies so that an alternate route can be established. Therefore, the impact to emergency access is considered less than significant.

- f) **Result in inadequate parking capacity?**

**Less than significant impact.** The construction activities may temporarily limit parking spaces along Avenue K. The contractor will be required to post "No Parking" signs in advance so that alternate parking accommodations can be made. Therefore, the impact to parking capacity is considered less than significant.

- g) **Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?**

**Less than significant impact.** The project alignment will require boring under the existing Metropolitan Transportation Authority and Union Pacific Railroad Company tracks east of Sierra Hwy. A Right of Entry permit has been acquired from both agencies. The construction activities will not affect railroad, bus, or any alternative transportation programs. Aside from

short-term impacts during construction, the proposed project will have no effect on any pedestrians or bicyclists. Therefore, the proposed project will have a less than significant impact on adopted policies, plans, or programs supporting alternative transportation.

**XVI. UTILITIES AND SERVICE SYSTEMS - Would the project:**

- a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?**

**No impact.** The project will not result in contamination or an increase in discharge of wastewater that might affect wastewater treatment. Thus, the proposed project will have no impact on the wastewater treatment requirements of the Regional Water Quality Control Board.

- b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?**

**No impact.** The proposed project will not result in the construction of new water or wastewater treatment facilities. Therefore, no impact is anticipated.

- c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?**

**No impact.** The proposed project will not result in the construction of new water drainage facilities. Therefore, no impact is anticipated.

- d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?**

**No impact.** The proposed project will improve and therefore beneficially impact the water supply needs to the service area to help meet the current domestic and fire protection supply requirements.

- e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?**

**No impact.** No increase in the number of wastewater discharge facilities will occur as a result of the proposed project. Therefore, the proposed project will have no impact on wastewater treatment.

- f-g) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs and comply**

**with Federal, State, and local statutes and regulations related to solid waste?**

**No impact.** Construction of the proposed project may result in excess excavated materials and construction debris. However, the amount of solid waste generated will be minimal. Project specifications will require the contractor to dispose of these materials in accordance to all applicable Federal, State, or local regulations related to solid waste. The proposed project will not result in a facility that will generate solid waste. Therefore, there will be no impact on landfill capacity.

## **XVII. MANDATORY FINDINGS OF SIGNIFICANCE**

- a) **Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?**

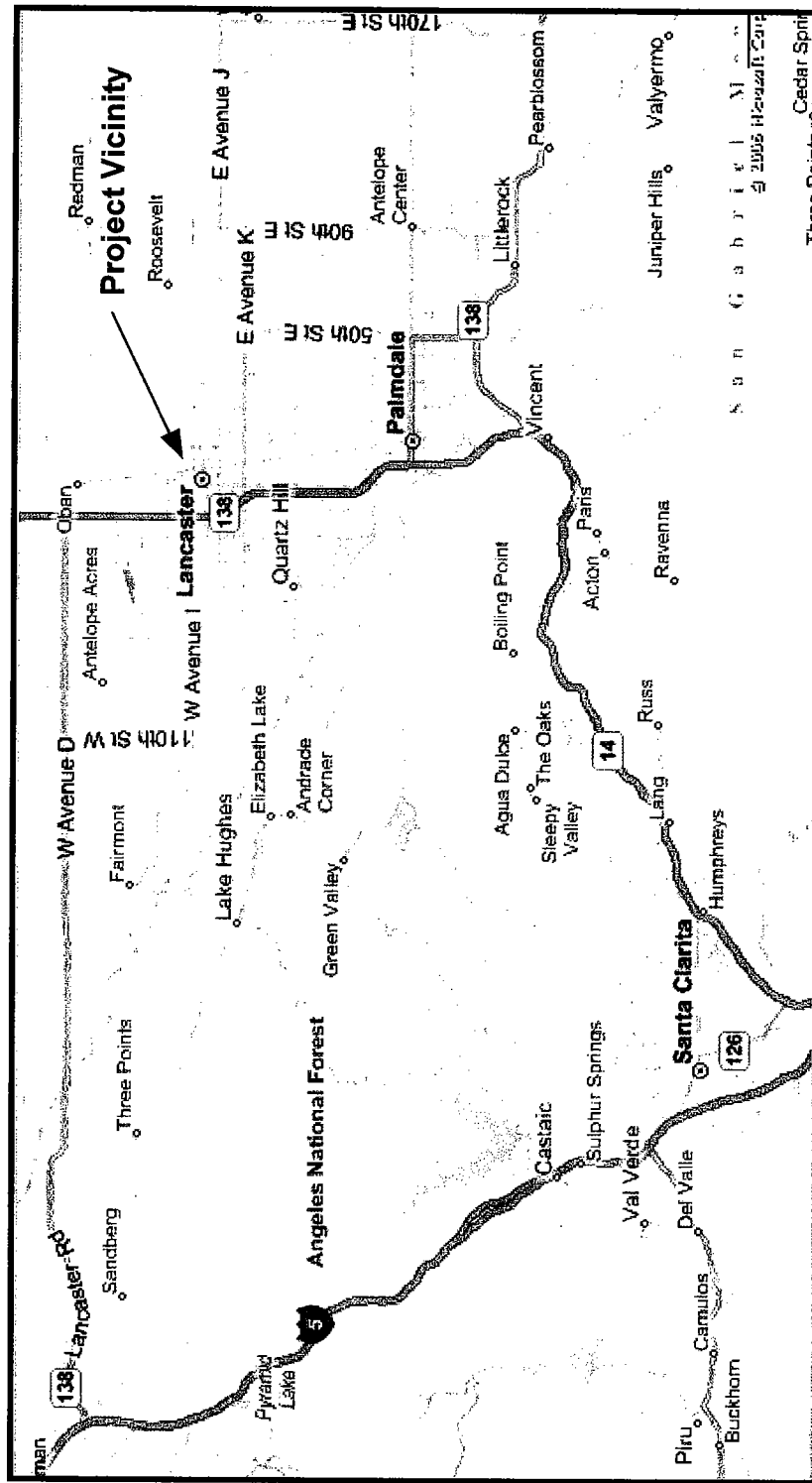
**No impact.** Construction of the proposed water main will be within the existing improved streets. The proposed project does not have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish and wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or eliminate important examples of the major periods of California history or prehistory. Therefore, the proposed project will have no impact on the environment.

- b) **Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects?)**

**No impact.** The purpose of the proposed project is to provide a reliable water supply source to help maintain the current water service in the City of Lancaster. The proposed project will not have any known impacts that are cumulatively considerable.

- c) **Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?**

**No impact.** The proposed project will have no environmental impacts that will cause substantial adverse effects on human beings, either directly or indirectly.



## EXHIBIT "A"

### PROJECT VICINITY

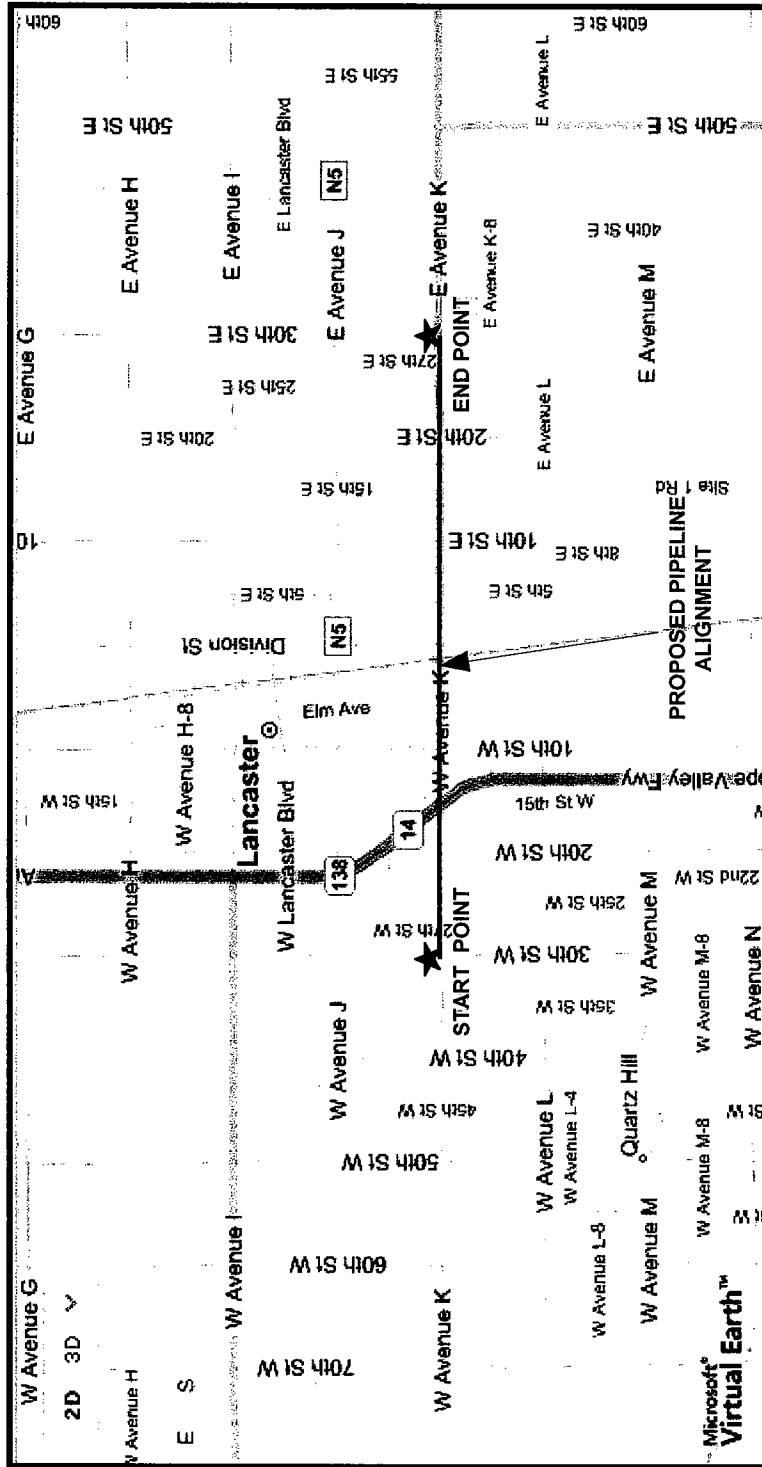
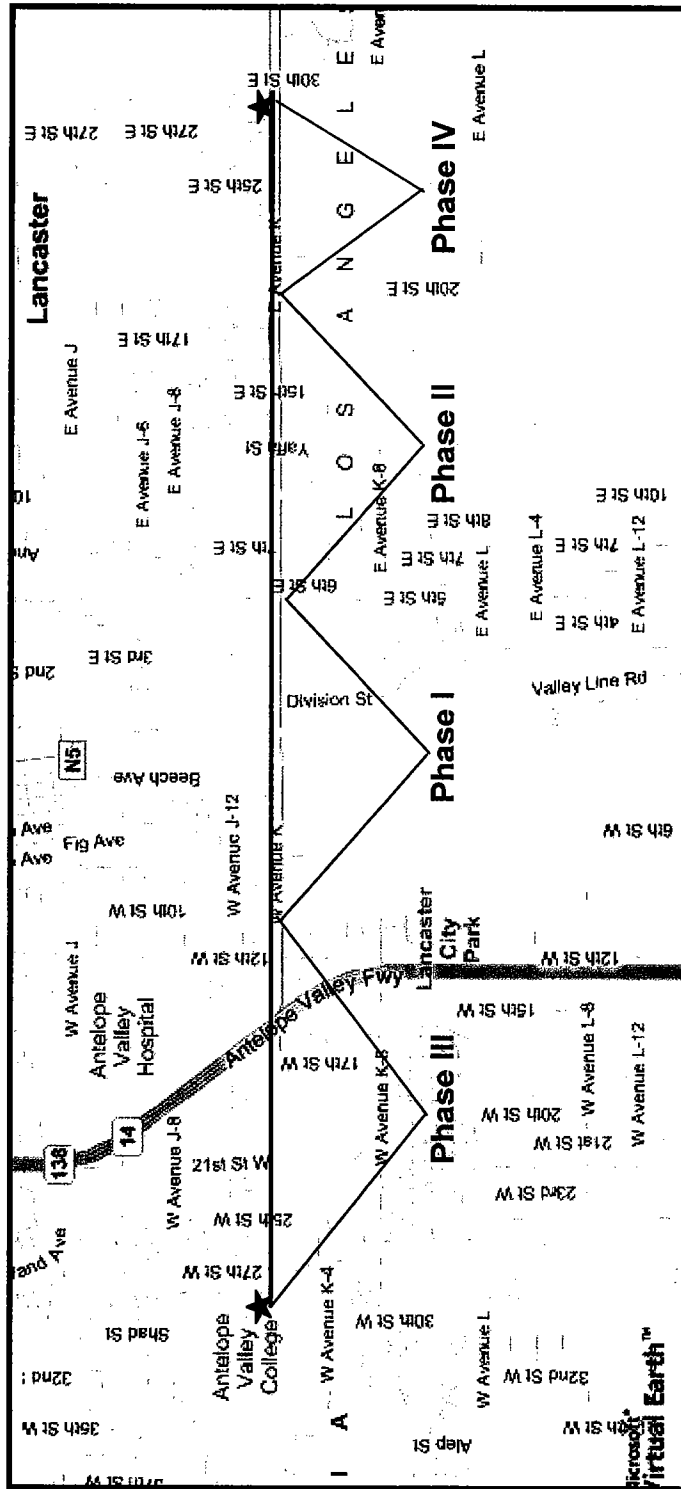
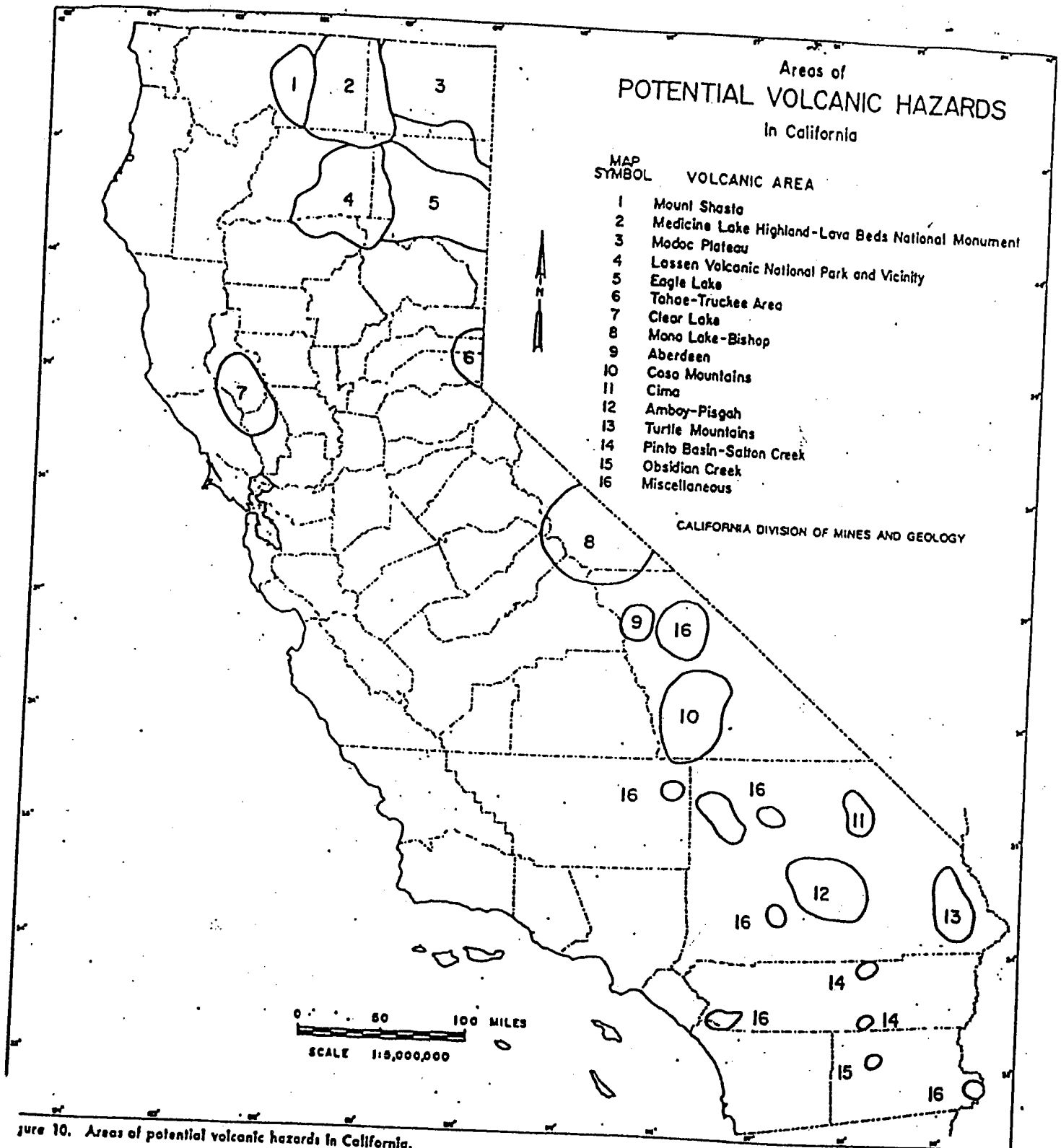


EXHIBIT "B"  
PROJECT  
LOCATION MAP



**EXHIBIT "C"**  
**PROJECT**  
**PHASING MAP**

# EXHIBIT "D"





A Phase 1 Archaeological Study For  
Design Services Los Angeles County Waterworks District No. 40  
31,000 Feet Of New Transmission Pipeline Along  
Avenue K Transmission Main Phases I, II, III, and IV  
Antelope Valley, County of Los Angeles, California

Prepared and submitted to:

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December, 2000

## Executive Summary

At the request of Brockmeier, Consulting Engineers, Inc. of Santa Monica, California, A Phase 1 Archaeological Study was prepared for an environmental document in support of Design Services Los Angeles County Waterworks District No. 40, 31,000 Feet Of New Transmission Pipeline Along Avenue K Transmission Main Phases I, II, III, and IV, Antelope Valley, County of Los Angeles, California. This document was intended to:

- \* Assist the client in achieving compliance with federal, state and county laws and policies regulating the performance of cultural resource studies in the County of Los Angeles.
- \* Integrate data obtained through a records search phase conducted by the South Central Coastal Information Center, California State University, Fullerton, Department of Anthropology, Fullerton, California (Appendix A).
- \* Research additional historical maps and studies pertaining to the project area.
- \* Perform an on-foot field reconnaissance for the 31,000 feet of proposed Transmission Pipeline along Avenue K. The survey area will consist of the paved street and a buffer of 15 feet (4.5 meters) on either side and at either end of the alignment. Proposed project impacts are projected to occur within existing, paved street right-of-way.
- \* Prepare a report documenting the results of the records search and field reconnaissance project phases which complies with appropriate federal and state cultural resource legislative enactments.
- \* Provide recommendations for alleviating adverse impacts to cultural resources encountered during the course of the records search and field reconnaissance project phases.

The project involves the construction of a new 31,000 feet long (9,300 meters) of new transmission pipeline along Avenue K in Lancaster, California. The project follows the existing street (Avenue K) from 30th Street West (forming the western project terminus) to 30th Street East (forming the eastern project terminus). The proposed alignment will essentially follow Avenue K in an east-west direction, lying on both sides of Highway 14, with the placement of the pipeline within the existing road alignment. The survey area will consist of the paved street and an additional buffer of 15 feet (4.5 meters) on either side and at either end of the alignment. Elevations within the right-of-way range from 2385 on the west, to 2424 on the east. Proposed project impacts will be confined to previously modified and disturbed areas within existing roadway.

The results of the records search phase indicated that:

- \* No prehistoric archaeological sites or isolates are identified within the project area.
- \* Two historic archaeological sites (19-001526 and 19-001527) have been identified within fifty feet of Avenue K, on the south side of the road between 20th Street and 30th Street. 19-001526 was recorded in 1989 by Richard Norwood of RT Factfinders as a pre-1915 homesite with associated household debris scattered over a large area. 19-001527 was recorded in 1990 by William Manley of Regional Environmental Consultants as a light trash scatter, water tank and well. No foundations were observed. Both sites are not located within the roadway and represent turn-of-the-century (1900-1920) occupation of the area.
- \* Nine prior surveys/excavations have been performed within a one-quarter mile radius of the study area (Anon 1996 - LA4008; Eggers, A.V. 1975 - LA2033; King, C. 1998 - LA 4392; Love 1988 - LA249; Love and DeWitt 1990a - LA2055, and 1990b - LA2088; Norwood 1989a - LA1761 and 1989b - LA1763; and Manley 1990 - LA1990). All of these surveys overlap small portions of the project area.

- \* No properties are listed on the National Register of Historic Places within the study area.
- \* No properties listed on the California State Historic Resources Inventory (HRI) lie within the study area.
- \* No California Historical Landmarks (1990), Office of Historic Preservation, California Department of Parks and Recreation are recorded within the project area.
- \* No California Points of Historical Interest (1992) are listed within the project area.

An inspection of historical maps (1854-1917) including the Elizabeth Lake USGS map series (1917 edition) indicated that by the early 1900s, a loose network of improved and unimproved roads was in place and scattered structures including residences, ranches and mining related buildings existed in the general area. Rosamond, Lancaster, Palmdale, Littlerock, Elizabeth Lake, Maynard, a dry lake the A.T.S.F railroad and the Southern Pacific Railroad (San Francisco and New Orleans Line) are listed by 1910. By the late 1920s (Lancaster USGS map (1929-31), Lancaster has major roads in place with development spreading in all directions from the heart of the city.

The on-foot field investigation was performed on Tuesday, December 19, 2000 by Robert Wlodarski serving in the capacity of Principal Investigator, and Dan Larson who performed the duties of Survey Archaeologist. The entire length of the proposed alignment was surveyed. Since the project area is currently paved, the surveyors inspected a 15-foot area (4.5 meters) on either side of Avenue K to assess potentially undisturbed soils adjacent to the proposed alignment. A total of sixteen person-hours were required to complete the field phase of this project.

### Results

No prehistoric or historic cultural resource remains were encountered during the field phase. Based on a thorough investigation of the proposed project alignment, the entire route will be constructed within graded and highly disturbed roadbed. The field investigation also inspected off-road areas including the shoulder, rodent burrows, exposed trenches, existing waterways, and other fortuitous exposures to ensure that no surface cultural resource remains would be affected by the proposed project.

### Conclusions/Recommendations

No foreseeable impacts to identified cultural resources are anticipated as a result of this project. This report only addresses the area illustrated in Figures 2a-2b. The results of this report cannot be used for any changes or modifications to the proposed project as discussed within the context of this report. Any subsequent changes will require additional work.

Since by its nature, a walk-over can only confidently assess the potential for encountering surface cultural resource remains, customary caution is advised when developing within the project area. Therefore, should unanticipated cultural resource remains be encountered during construction or land modification activities, work must stop, and the County of Los Angeles Planning Director shall be contacted immediately to determine appropriate measures to mitigate adverse impacts to the discovered resources. Cultural resource remains may include artifacts, shell, bone, features, altered soils, foundations, trash pits and privies, etc. If human remains are discovered, then the procedures described in Section 7050.5 of the California Health and Safety Code shall be followed. These procedures require notification of the coroner. If the coroner determines that the remains are those of Native American ancestry, then the Native American Heritage Commission (NAHC) must be notified by phone within 24 hours. Sections 5097.94 and 5097.98 of the Public Resources Code, describe the procedures to be followed after the notification of the NAHC.

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## I. Introduction

### 1.1 Scope of the Project

At the request of Brockmeier, Consulting Engineers, Inc. of Santa Monica, California, A Phase 1 Archaeological Study was prepared for an environmental document in support of Design Services Los Angeles County Waterworks District No. 40, 31,000 Feet of new transmission pipeline along Avenue K Transmission Main Phases I, II, III, and IV, Antelope Valley, County of Los Angeles, California. The objectives of this study were to:

1. Assist the client in achieving compliance with federal, state and county laws and policies which regulate the performance of cultural resource studies within Los Angeles County.
2. Integrate data obtained through a records search phase conducted by the South Central Coastal Information Center, California State University, Fullerton, Department of Anthropology, Fullerton, California (Appendix A).
3. Investigate additional, applicable historical source material including maps and studies pertaining to the project area.
4. Perform an on-foot archaeological reconnaissance for the 31,000 feet of new Transmission Pipeline along Avenue K. The survey area will consist of the paved street and an additional buffer of 15 feet (4.5 meters) on either side and at either end of the alignment. Proposed project impacts will be confined to previously modified and developed areas.
5. Prepare a report documenting the results of the records search and field reconnaissance phases which complies with federal and state cultural resource legislative enactments.
6. Provide recommendations for alleviating adverse impacts to cultural resources encountered during the course of the records search and field reconnaissance project phases.

### 1.2 Description of the Project

The project involves the construction of a new 31,000 feet long (9,300 meters) of new transmission pipeline along Avenue K in Lancaster, California. The project follows the existing street (Avenue K) from 30th Street West (forming the western project terminus) to 30th Street East (forming the eastern project terminus). The proposed alignment will essentially follow Avenue K in an east-west direction, lying on both sides of Highway 14, with the placement of the pipeline within the existing road alignment. The survey area will consist of the paved street and an additional buffer of 15 feet (4.5 meters) on either side and at either end of the alignment. Proposed project impacts will be confined to previously modified and disturbed areas within existing roadway.

### 1.3 Location of the Project

The project area is situated northeast of the San Fernando Valley, south of Edwards Air Force Base and north of Palmdale in the Antelope Valley within the Lancaster city limits (Figure 1). The project alignment can be found on the Lancaster East USGS Topographic map (1958 - photorevised 1974) encompassing portions of Sections 3, 19, 20 and 29 of Township 7 North and Range 11 West, and on the Lancaster West USGS Topographic map (1958 - photorevised 1974) encompassing portions of Sections 19 through 30) of Township 7 North and Range 12 West (Figure 2).

## II. Environmental Summary

### 2.1 Physiography

The Antelope Valley is located in the westernmost portion of the Mojave Desert and consists of

FIGURE

1



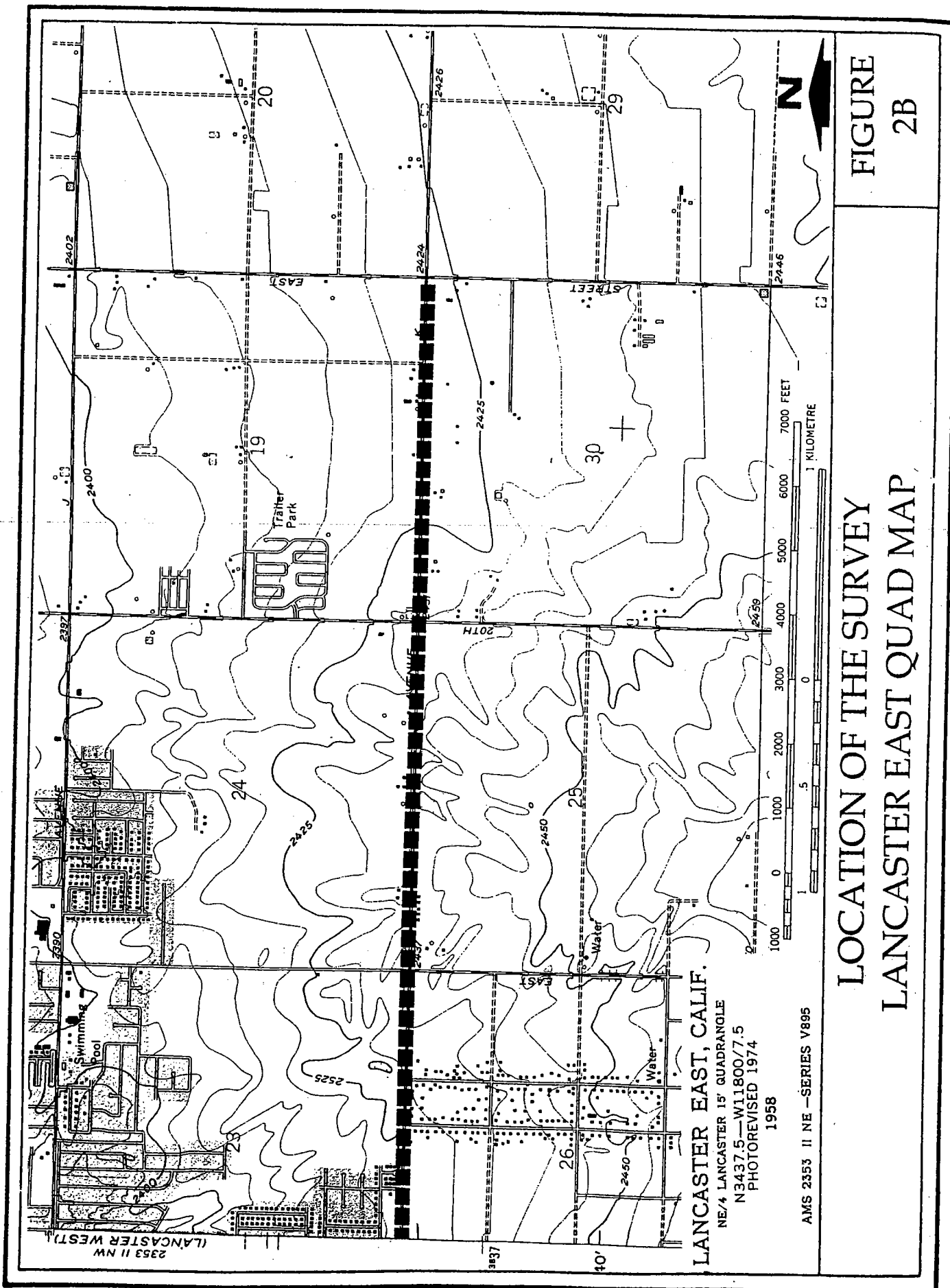


FIGURE  
2B

LOCATION OF THE SURVEY  
LANCASTER EAST QUAD MAP



roughly 3,000 square miles of land. The valley is bordered on the northwest by the Tehachapi Mountains which separates this land mass from the San Joaquin Valley, and on the south and southwest by the San Gabriel Mountains. The northern and eastern boundaries consist of isolated buttes. This geomorphic basin has no outlet for its streams, and all rain water either becomes part of the underground aquifer or settles in the lower part of the valley. Twelve creeks trend into the valley from the south and transport precious water into the area during the rainy season including Sheep, Bone Yard, Muscal, Deadman, Pallett, Boulder, La Montaine, Bob's Gap, Big Rock, Sand, Little Rock and Amargosa. The San Andreas Fault trends along the entire southern slope of the Antelope valley forming a series of long, narrow, enclosed basins.

### III Cultural Setting

#### 3.1 Prehistoric Information

At the time of Spanish exploration, the project area was occupied by the Serrano who were also called Vanyume or Kitanemuk (Figure 3). They consisted of autonomous localized sibs and their land- holding lineages were further divided into exogamous totemic moieties with ritual and ceremonial obligations (Kroeber, 1925:615-616). Each clan retained control over several areas (usually a creek and the strip of land surrounding it) from which they gathered their food resources during the course of the year. They were also part of a larger trade network that extended throughout California. Coalitions with other Serrano clans were based on reciprocal ceremonial, marital and economic relationships. They also established alliances with similarly organized Cahuilla, Chemehuevi, Gabrielino, and Cupeno.

The Serrano spoke a Takic language. Takic speaking groups historically occupied the Los Angeles Basin off shore islands and surrounding areas extending south to the San Luis Rey River and east to the Mojave sink and the Coachella Valley and north to the San Joaquin Valley apparently established themselves in the area around 800 BC. The Takic languages are a division of the Uto-Aztecan language stock. People speaking the ancestral Takic language may have been able to establish themselves because of their more complex political organization.

Primary Serrano villages were located in the foothills with some settlements situated in higher transitions zones as well as along the desert floor. Access to water was the determining factor in selecting habitation sites. They lived in single-family dwellings which were circular, domed structures constructed over an excavated area. The houses had willow frames covered over with tule and brush mats secured to the framework, and Served primarily as sleeping areas. A majority of the activities took place outside or under roofed structures without walls, called ramadas. The only other buildings in the villages were ceremonial houses occupied by the village priest and used for religious rites and ceremonial activities, and a granary for storing provisions (Stickel and Weinman-Roberts, 1980:99).

The Serrano were accomplished potters and basket makers. Their pottery was made of coiled clay, smoothed with a paddle and dried in the sun before being fired in a pit. Baskets were fabricated from yucca fiber, willow, reeds, and local grasses. Their artifact inventory included: musical instruments such as rattles, flutes, and whistles; utensils and ornaments such as fire drills, pipes, mortars, metates, beads, pendants, awls, and projectile points from wood, shell, bone and stone. Petroglyphs abound on rock surfaces in the Serrano territory. Abstract and geometric designs are interspersed with representational figures of sheep, lizards, human beings, and possible celestial bodies. They are typical of those found throughout the Great Basin area.

# NATIVE TRIBES, GROUPS, DIALECTS, AND FAMILIES OF CALIFORNIA IN 1770

\* = TLAHOMTAHOI



PROJECT AREA IN RELATION  
TO TRIBAL BOUNDARIES

FIGURE  
3

The Serrano sustained a hunting and gathering economy, exploiting virtually every possible food resource in their environment. Hunting was generally the task of the males who used bows and arrows, throwing sticks, traps and snares to catch deer, antelope, mountain sheep, rabbits, and other rodents, and various birds, especially quail. The women collected seeds, tubers, roots, acorn and pinon nuts. Although they did not engage in agricultural activities per se, the Serrano manipulated the natural plant environment by annually harvesting the acorn crop and by burning areas where chia seeds grew, thereby increasing the yield (Stickel & Weinman-Roberts 1980: 100).

Abandonment of the permanent Anasazi settlements in the southern parts of Nevada and Utah at the beginning of this period ended their influence in the Mojave. At this time, there is a noticeable change in point types, as the Cottonwood series and the small Desert Side Notched series become the predominant types. These points are generally associated with the Numic expansion throughout much of California and the Great Basin. Knowledge concerning the Serrano is summarized by Bean and Smith (1978) while Bean and Blackburn (1978) summarized the closely related Kitanemuk. The evolution of Serrano society resulted in a complex and unique society described by early Spanish explorers and colonists after AD 1603.

### 3.3 Historical Information

There were no known permanent village on the floor of the Antelope Valley. Instead, the desert valley provided trade routes from Arizona and New Mexico to the California coast. Although California was discovered in the 1500s, it was not until the later part of the 1700s that exploration was initiated. Captain Pedro Fages, an officer in Portola's expedition, is credited as being the first white man to set foot in the Antelope Valley in 1772. Franciscan Friar, Father Garces, crossed the western end of the Antelope Valley in 1776 while traveling from the Colorado River to the five coastal missions that were in existence. During 1827, Jedediah Smith traversed the Antelope Valley as the first American to visit California by land. By 1829, Kit Carson, while trapping, explored portions of the Antelope Valley. Gold was first discovered by Francisco Lopez in 1842 at the southern edge of the Antelope Valley in what is now Placerita Canyon bringing a brief influx of miners to the region. Finally, John C. Fremont, during 1844, conducted a scientific exploration of the region (Figure 4).

From the 1840s the valley was used primarily for hunting antelope and as a hideout for bandits like Joaquin Murrieta and Tiburcio Vasquez. Don Alexander and Phineas Banning established the first stage line from Los Angeles to the north, running through the southernmost edge of the Antelope Valley. During the 1870s, small ranches and homesteads sprang up around surface water sources. The Southern Pacific Railroad completed a line through the Antelope Valley in September, 1876. With the completion of the railroad, the settlers came, and Palmdale and the Antelope Valley ended years of isolation. Figures 5-7 illustrate the growth and development of the area from 1884-1929. Today, Edwards Air Force base, a thriving defense economy, and people looking for a less hectic lifestyle, have created a rapidly growing suburban environment in Lancaster and Palmdale.

## IV. Background Research Information

As part of this study, research was conducted for the project area using information obtained from historic maps, archival data, and prior studies. An inspection of the following sources included:

1. A records search phase conducted by the South Central Coastal Information Center,

Scale of Miles  
0 10 20 30 40 50 60 70 80 90 100

Mr. Jackson

## L Tympaniços

Yucca India

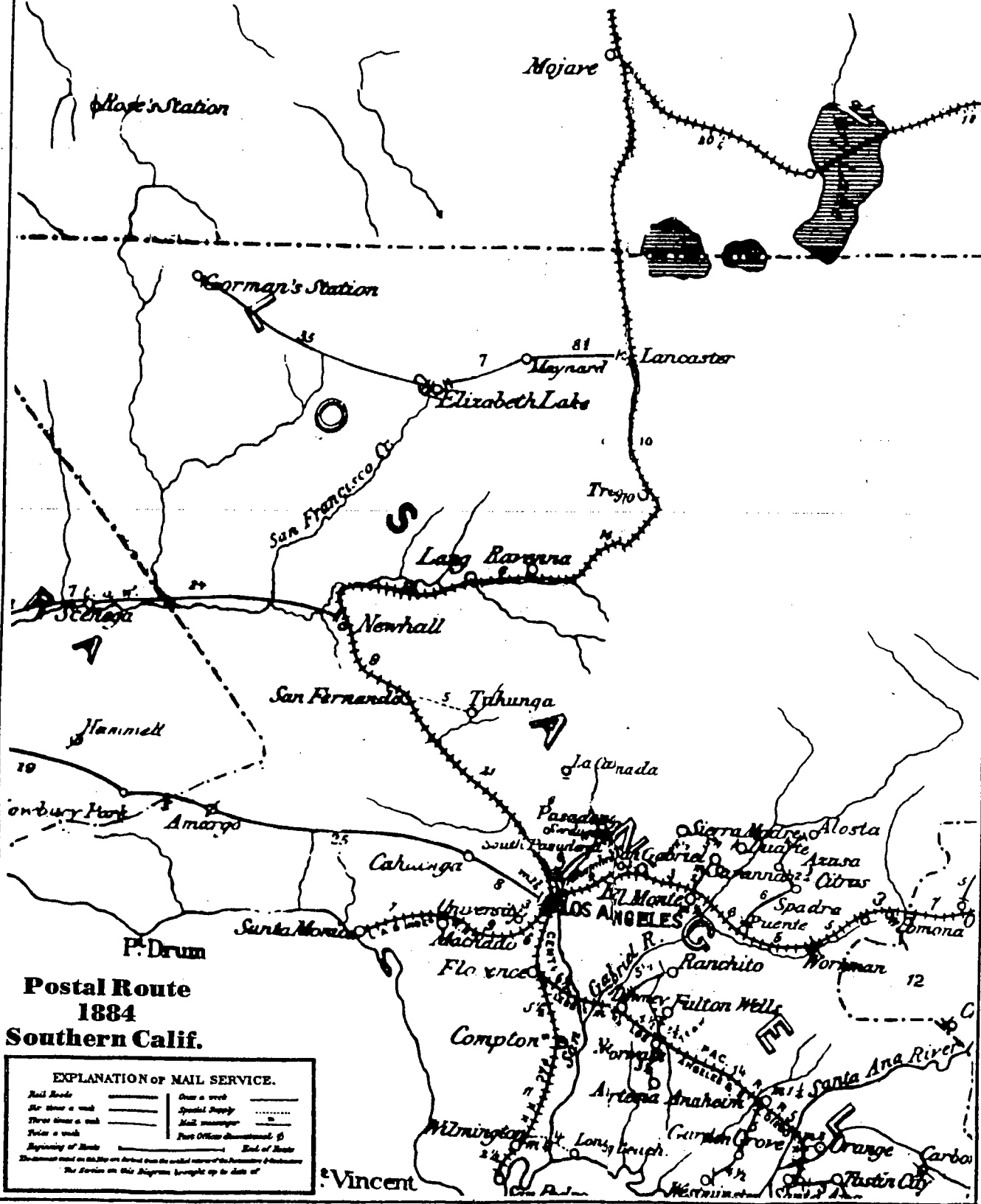
# P A I U C H E S

**DESERT**

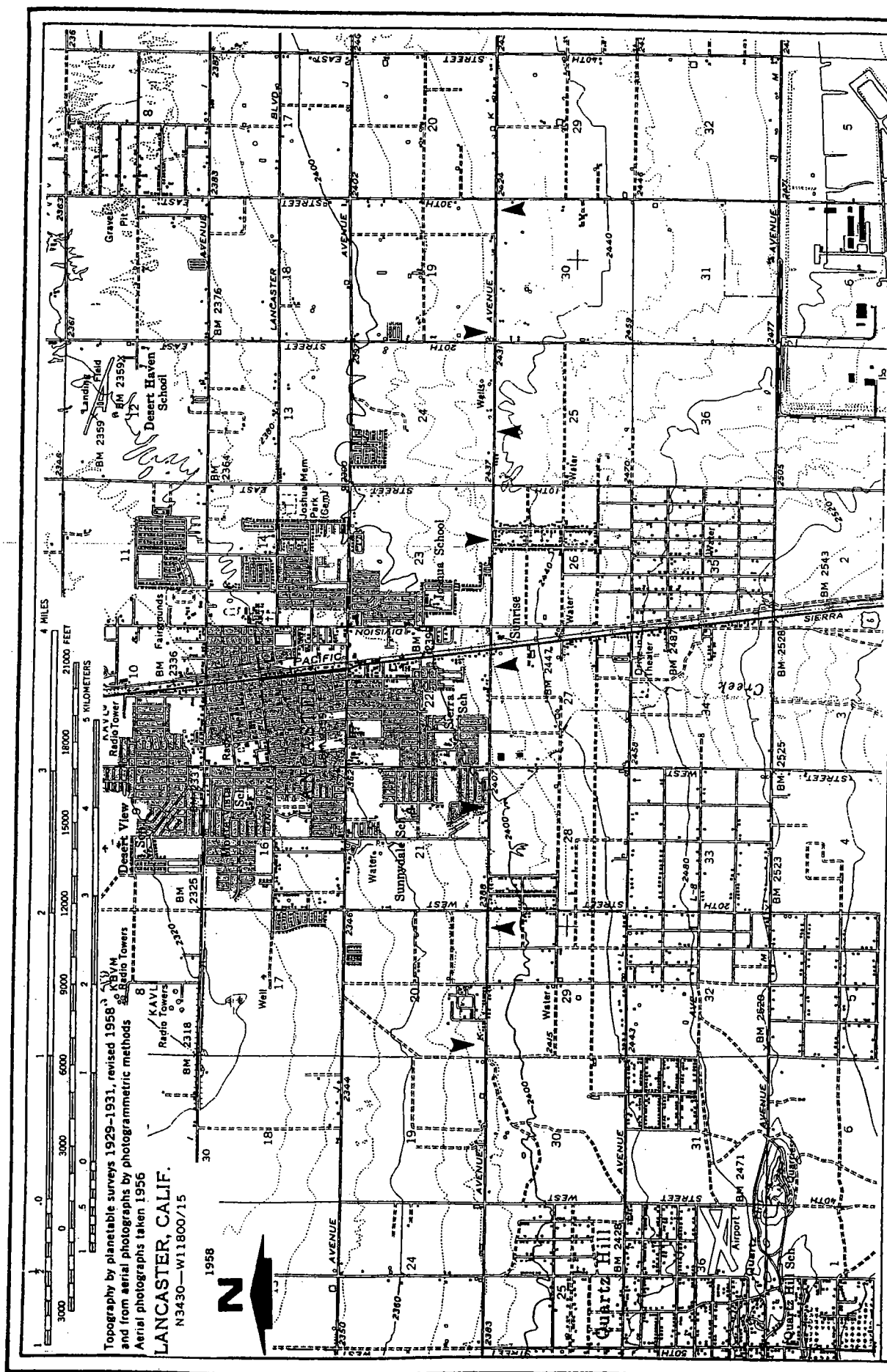
[illegible]

FIGURE

4







# THE PROJECT AREA AS SURVEYED IN 1929-1931 (Revised in 1958)

# FIGURE

2

California State University, Fullerton, Department of Anthropology, Fullerton, California (Appendix A).

2. National Register of Historic Places (Federal Register-8/94-with supplements to date).
3. California State Historic Resources Inventory (HRI) (Department of Parks and Recreation 1976).
4. California Historic Landmarks (California Department of Parks and Recreation 1990).
5. California Points of Historical Interest (1992).

The results of the records search phase indicated that:

- \* No prehistoric archaeological sites or isolates have been identified within or directly adjacent to the project area.
- \* Two historic archaeological sites (19-001526 and 19-001527) have been identified within fifty feet of Avenue K, on the south side of the road between 20th Street and 30th Street. 19-001526 was recorded in 1989 by Richard Norwood of RT Factfinders as a pre-1915 homesite with associated household debris scattered over a large area. 19-001527 was recorded in 1990 by William Manley of Regional Environmental Consultants as a light trash scatter, water tank and well. No foundations were observed. Both sites are not located within the roadway and represent turn-of-the-century (1900-1920) occupation of the area.
- \* Nine prior surveys/excavations have been performed within a one-quarter mile radius of the study area (Anon 1996 - LA4008; Eggers, A.V. 1975 - LA2033; King, C. 1998 - LA 4392; Love 1988 - LA249; Love and DeWitt 1990a - LA2055, and 1990b - LA2088; Norwood 1989a - LA1761 and 1989b - LA1763; and Manley 1990 - LA1990). All of these surveys overlap small portions of the project area.
- \* No properties are listed on the National Register of Historic Places within the study area.
- \* No properties listed on the California State Historic Resources Inventory (HRI) lie within the study area.
- \* No California Historical Landmarks (1990), Office of Historic Preservation, California Department of Parks and Recreation are recorded within the project area.
- \* No California Points of Historical Interest (1992) are listed within the project area.

An inspection of historical maps (1854-1917) on file at the Geography Department Map Reference Center, California State University, Northridge, and County of Los Angeles, Department of Public Works, Bureau of Engineering, included:

1854-76	Township 7 North, Range 11 and 12 West, San Bernardino Meridian.
1869	Map of Private Grants and Public Lands Adjacent to Los Angeles and San Diego in the Southern Parts of California (published by Clinton Day).
1881	Map of the County of Los Angeles, California (by H.J. Stevenson).
1888	Map of the County of Los Angeles, California (by Rowan).
1891	Map of the Reservoir Lands in the County of Los Angeles (by Seebold).
1900	Sectional and Road Map of Los Angeles County Showing Oil and Mining Districts (by Stoll and Thayer).
1900	Elizabeth Lake USGS map series (1917 edition).
1908	Topographic Map of the Los Angeles Aqueduct and Adjacent Territory (compiled from U.S.G.S. topographic maps; Wheeler's war maps; Le Conte's maps; county maps, and; L.A. Aqueduct maps).
1911	Los Angeles County (Blunt).
1958	Lancaster 15 minute USGS topographic map (surveyed in 1929-31).



## V.

## Field Reconnaissance Phase

### 5.1 Crew

The crew consisted of Robert Wlodarski, the Principal Investigator of H.E.A.R.T., who has a B.A. in History and Anthropology; an M.A. in Anthropology from California State University Northridge (CSUN); 30 years of professional experience in California archaeology; over 500 individual projects completed; certification in field archaeology, and theoretical/archival research by the Register of Professional Archaeologists [RPA]; and, is a registered California historian by the California Committee for the Promotion of History [CCPH]. The Principal Investigator was assisted in the field by Dan Larson who has a B.A. in Anthropology from California State University Northridge (CSUN), with over 36 years of professional experience in California archaeology, and meets the qualifications for certification in field archaeology by the Register of Professional Archaeologists [RPA].

### 5.2 Field Reconnaissance Strategy

The field reconnaissance for the proposed pipeline entailed a mixed survey strategy which included: A survey by car of those areas which are completely covered by pavement or where development has completely covered the surface; and an on-foot reconnaissance of all areas within the proposed alignment which were essentially open space elements (open fields or exposed dirt shoulders). For this project, an additional buffer of 15 feet (4.5 meters) on either side and at either end of the alignment were inspected to determine if cultural resource remains of a prehistoric or historic archaeological nature would be affected by the proposed project.

### 5.3 Results

The on-foot field investigation was performed on Tuesday, December 19, 2000 by Robert Wlodarski serving in the capacity of Principal Investigator, and Dan Larson who performed the duties of Survey Archaeologist. The entire length of the proposed alignment was surveyed. Since the project area is currently paved, the surveyors inspected a 15-foot area (4.5 meters) on either side of Avenue K to assess potentially undisturbed soils adjacent to the proposed alignment. A total of sixteen person-hours were required to complete the field phase of this project.

No prehistoric or historic cultural resource remains were encountered during the field phase. Based on a thorough investigation of the proposed project alignment, the entire route will be constructed within graded and highly disturbed roadbed. The field investigation also inspected off-road areas including the shoulder, rodent burrows, exposed trenches, existing waterways, and other fortuitous exposures to ensure that no surface cultural resource remains would be affected by the proposed project. The field results and notations about existing conditions in field follows:

#### Western portion of the project

Proceeding west along Avenue K on the north side of the road: Northside shopping center (including Carl's Junior, Burger King, Toys-r-us, Coco's; Highway 14 overpass and on-ramp; Park and Ride facility; Marie Calanders; Oxford Inn; Alta Dena Express; 17th Street West; Hughes Plaza; Century 21 Office; Eye Care and Dental Center; Oakwood Building (including Infinity Mortgage and Troth Realty); open lot; 20th Street; Denny's; Clocktower Plaza and parking; residential development with brick wall fronting Avenue K; 22nd Street West; residential development with brick wall fronting Avenue K; 24th Street West; residential development with brick wall fronting Avenue K; 25th Street West; residential development (including 2539-2647

Avenue K West); 27th Street; residential development (including 2707-2747 Avenue K West); Eliopulos Drive; more residential development; 30th Street (western terminus).

Proceeding east along Avenue on the south side of the road: Open lot with a bus stop; residential development with brick wall fronting Avenue K; 27th Street West; residential development (including 2652-2506 Avenue K West); 25th Street West; residential development (including 2358-2330 Avenue K West); open lot; Westfield Drive and gated residential community; open field; 22nd Street West; Kinder Care; Pinecrest School; shopping mall (Albertsons and Savon, etc.); Jack-in-the-Box; Green Burrito; 20th Street West; Arco gas station; Pinnacle Mortgage; auto parts; residential development (including 1816-1802 Avenue K West; 25th Street West); 18th Street West; Chevron gas station; abandoned structure; open lot; Der Wienerschnitzel; Village Square; 17th Street West; Carrows; Motel 6; Highway 14 on-ramp and overpass.

#### Eastern portion of the project

Proceeding east along Avenue K on the south side of the road: Highway landscaping; 15th Street West; Freeway off-ramp; Arco mini-mart; Ross for Less; Big 5; 13th Street West; Kragen Auto Parts; Sees Candy; Ralphs; Pic N Save; McDonalds; 12th Street West; Washington Mutual; Don Cuco's; target; Walden Books; Band of America; open lot; 10th Street West; Christmas tree lot; large, asphalt parking lot; open lot; Bingo Parlor; Gadsden Avenue; Woodcreek garden Apartments; open lot at 500 West Avenue K; Furniture place; Sierra Highway; railroad tracks; open lot; Division Street; open lot; Dallas' Trees; open lot; BPO Elks #1625; Antelope Town Homes (apartments); Kirkland Avenue; Antelope Town Homes; golf driving range (Lancaster Golf Center); 5th Street East; Alta Dena Dairy Express market; open lot; 6th Street East; Liquor market; open lot; abandoned building; 634 East Avenue K (residence); Lillput Nursery School; residential development (including 646 East Avenue K); 7th Street East; residential development (including 714 and 720 East Avenue K); catch basin; 750 East Avenue K (residence); open lot; 790 and 806 East Avenue K (residences); Olympia Plaza; Challenger Way; Springfield Plaza; residential development; 11th Street East; residential development; open lot; residential development; private road; residential development; Yaffa Street; residential development; Carol Drive; residential development with a brick wall fronting Avenue K East; 15th Street East; residential development with a brick wall fronting Avenue K East; a new development called the Le Palais ( just graded land and brick wall); 20th Street East; open lot; residential development with a brick wall fronting Avenue K East; open lot; residence (2300 East Avenue K); open space; residence (2516 East Avenue K); brick wall; residence; Iglesia church at 2548 Avenue K East; open lot where historic remains are visible in the distance from the road (CA-LAN-1527H); 30 Street East.

Proceeding west along Avenue K on the north side of the road: Residential development; Santa Rosa Circle; residential development (2757-2727 Avenue K East); 27th Street East; parking lot; residential development with a brick wall and sidewalk fronting Avenue K East; 25th Street East; residential development with a brick wall and sidewalk fronting Avenue K East; 22nd Street East; open lot with a dirt shoulder; 20th Street East; residential development with a paved road and landscaping paralleling Avenue K East; Standcliff Avenue; residential development with a paved road and pine trees and landscaping paralleling Avenue K East; 17th Street East; residential development with a paved road and landscaping paralleling Avenue K East; residential development with brick wall fronting Avenue K East; gated residential development; Christmas Treet lot; 15th Street East; residential development with brick wall fronting Avenue K East; 13th Street East; residential development with brick wall fronting Avenue K East; Yaffa Street;

residential development with brick wall fronting Avenue K East; apartments; Texaco gas station; Challenger Way; brick building and parking lot under construction; open lot with dirt shoulder; 8th Street East; residential development; open lot with a dirt shoulder; 7th Street East; residential development with brick wall fronting Avenue K East; 6th Street East; residential development with brick wall fronting Avenue K East; 5th Street East; open and graded lot; residential development with brick wall and chain link fencing fronting Avenue K East; 4th Street East; open lot; blue, clapboard house; open lot with a dirt shoulder; Stanridge condo unit with parallel asphalt road; open lot with a dirt shoulder; Liquor mart (8 ball); Division Street; Arco gas station; parking lot; open lot; railroad tracks; Sierra Highway; Smog Center; Karen's Kitchen; open space; Muffler Shop; open lot; building; The Colony Park condos with asphalt road paralleling Avenue K West; Elm Avenue; residential development with brick wall fronting Avenue K West; Fig Avenue; residential development with a paved road and landscaping paralleling Avenue K West; Gadsden Avenue; plaza; Firestone Tires; used car lot; RV rentals; Enterprise rental cars; Chevron station; 10th Street West; used car lot; KC Custom Mouldings; KFC; strip mall; Designer Furniture; 12th Street West; Quick Key; First Place Awards; Quality Care Providers; drainage channel; paved open space; Toys R Us shopping center; 15th Street West.

#### 5.4 Conclusions/Recommendations

No foreseeable impacts to identified cultural resources are anticipated as a result of this project. This report only addresses the area illustrated in Figures 2a-2b. The results of this report cannot be used for any changes or modifications to the proposed project as discussed within the context of this report. Any subsequent changes will require additional work.

Since by its nature, a walk-over can only confidently assess the potential for encountering surface cultural resource remains, customary caution is advised when developing within the project area. Therefore, should unanticipated cultural resource remains be encountered during construction or land modification activities, work must stop, and the County of Los Angeles Planning Director shall be contacted immediately to determine appropriate measures to mitigate adverse impacts to the discovered resources. Cultural resource remains may include artifacts, shell, bone, features, altered soils, foundations, trash pits and privies, etc. If human remains are discovered, then the procedures described in Section 7050.5 of the California Health and Safety Code shall be followed. These procedures require notification of the coroner. If the coroner determines that the remains are those of Native American ancestry, then the Native American Heritage Commission (NAHC) must be notified by phone within 24 hours. Sections 5097.94 and 5097.98 of the Public Resources Code, describe the procedures to be followed after the notification of the NAHC.

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- 1989b Cultural Resource Survey for GPA-88-29, Lancaster, California. Report (LA1763) on file at the South Central Coastal Information Center, Department of Anthropology, California State University, Fullerton.

Stickel, E. Gary, and Lois J. Weinman-Roberts

- 1980 An Overview of the Cultural Resources of the Western Mojave. Bureau of Land Management, Cultural Resources Publication Anthropology-History, Riverside, California.

## APPENDIX A

South Central Coastal Information Center  
*California Historical Resources Information System*

California State University, Fullerton  
Department of Anthropology  
P.O. Box 6846

800 North State College Boulevard  
Fullerton, California 92834-6846

Phone: 714-278-5395 - Fax: 714-278-5542

Website: [anthro.fullerton.edu/sccic.html](http://anthro.fullerton.edu/sccic.html)

(Prepared by Esther Won on December 18, 2000 - Invoice #9074)

**South Central Coastal Information Center**

*California Historical Resources Information System*

California State University, Fullerton

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Fullerton, CA 92834-6846

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[anthro.fullerton.edu / sccic.html](http://anthro.fullerton.edu/sccic.html)

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*Los Angeles*

*Orange*

*Ventura*

December 18, 2000

Rob Wlodarski

H.E.A.R.T

RE: Records Search for 31, 000 Feet of New Transmission Pipeline Along Avenue K

Dear Mr. Wlodarski,

As per your request received on December 18, we have conducted a records search for the above referenced project. This search includes a review of all recorded historic and prehistoric archaeological sites within your radius of the project area as well as a review of all known cultural resource reports. The following is a discussion of our findings.

**LANCASTER EAST QUADRANGLE**

**PREHISTORIC RESOURCES:**

No prehistoric sites have been identified within your radius of the project area.

**HISTORIC RESOURCES:**

Two historic archaeological sites (19-001526, 19-001527) have been identified within your radius of the project area (see enclosed map).

**PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS:**

Six studies have been conducted within your radius of the project area. There is one additional investigations located on the Lancaster East 7.5' USGS quadrangle and are potentially within your radius of the project area. These reports are not mapped due to insufficient locational information.

**LANCASTER WEST QUADRANGLE**

**PREHISTORIC RESOURCES:**

No prehistoric sites have been identified within your radius of the project area.

## HISTORIC RESOURCES:

No historic archaeological sites have been identified within your radius of the project area.

## PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS:

Three studies have been conducted within your radius of the project area. There are two additional investigations located on the Lancaster West 7.5' USGS quadrangle and are potentially within your radius of the project area. These reports are not mapped due to insufficient locational information.

Please forward a copy of any reports resulting from this project to our office as soon as possible. Due to the sensitive nature of site location data, we ask that you do not include record search maps in your report. If you have any questions regarding the results presented herein, please feel free to contact our office at (714) 278-5395.

Invoices are mailed approximately two weeks after records searches are completed. This enables your firm to request further information under the same invoice number. **Please reference the invoice number listed below when making inquiries.** Requests made after invoicing will result in the preparation of a separate invoice with a \$15.00 handling fee.

Sincerely,



Esther Won  
Staff Archaeologist

### Enclosures:

- (X) Primary Number Explanation
- (X) Map - Lancaster East, Lancaster West 7.5' USGS Quadrangle
- (X) Bibliography - \_\_\_ pages
- ( ) Site list - \_\_\_ pages
- ( ) HRI - \_\_\_ pages
- ( ) National Register Status Codes - 4 pages
- (X) Site records - 19-001526 (16pgs), 19-001527 (6pgs)
- (X) Survey reports - LA4392 (18pgs)
- (X) Confidentiality Form
- ( ) Invoice # 9074

# **EXHIBIT "F"**

## **GEOTECHNICAL ENGINEERING REPORT**

Proposed Avenue K Transmission Line  
Phases I, II, III, and IV  
Los Angeles County Waterworks District No. 40  
Avenue K, 30<sup>th</sup> Street West to 30<sup>th</sup> Street East  
Lancaster, Los Angeles County, California  
**PL-05531-01**

**PREPARED FOR**  
**BROCKMEIER CONSULTING ENGINEERS, INC.**

**February 9, 2001**

**Prepared By**

**Earth Systems  
Southern California  
1024 West Avenue M-4  
Palmdale, California 93551  
(661) 948-7538  
FAX (661) 948-7963**





**Earth Systems**  
**Southern California**

1024 West Avenue M-4  
Palmdale, CA 93551  
(661) 948-7538  
Fax (661) 948-7963

February 9, 2001

PL-05531-01

Brockmeier Consulting Engineers, Inc.  
1304 Olympic Boulevard  
Santa Monica, California 90404-3726

Attention: Mr. Gary Roepke

Subject: **Geotechnical Engineering Report**  
Proposed Avenue K Transmission Main – Phases I, II, III, and IV  
Los Angeles County Waterworks District No. 40  
Avenue K, 30<sup>th</sup> Street West to 30<sup>th</sup> Street East  
Lancaster, Los Angeles County, California

Presented herewith is Earth Systems Southern California's (ESSC's) Geotechnical Engineering Report prepared, as authorized, for the alignment of a proposed water transmission main line to be constructed in Lancaster, Los Angeles County, California. The water line is to be installed in Avenue K, between 30<sup>th</sup> Street West and 30<sup>th</sup> Street East, in the City of Lancaster, Los Angeles County, California. The conclusions and recommendations contained in this report are based upon ESSC's understanding of the proposed development and on analyses of the data obtained from the field and laboratory testing programs. The recommendations provided in this report generally relate to criteria for pipeline installation and design pressures. ESSC strives to provide its analyses and recommendations in accordance with the applicable standards of care for our profession at the time this study was conducted.

This report completes ESSC's scope of geotechnical engineering services authorized on December 18, 2000, which were performed in accordance with our proposal dated April 28, 2000. Other services that may be required, such as grading observation and construction testing, are additional services and will be billed according to the Fee Schedule in effect at the time such services are provided. Budgets for these services, which are dependent upon design and construction schedules, can be provided when requested.

Earth Systems Southern California appreciates this opportunity to provide professional geotechnical engineering services for this project. If you need clarification of the information contained in this report, or if we can be of additional service, please contact the undersigned.

Respectfully submitted,

Earth Systems  
Southern California

Bruce A. Hick  
Project Geotechnical Engineer

Distribution: 6 – Brockmeier Consulting Engineers, Inc.

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**GEOTECHNICAL ENGINEERING REPORT  
PROPOSED AVENUE K TRANSMISSION MAIN  
PHASES I, II, III, AND IV  
LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 40  
AVENUE K, 30<sup>TH</sup> STREET WEST TO 30<sup>TH</sup> STREET EAST  
LANCASTER, LOS ANGELES COUNTY, CALIFORNIA**

**INTRODUCTION**

This Geotechnical Engineering Report has been prepared for the alignment of a proposed water transmission main to be constructed in Lancaster, Los Angeles County, California. The water line is to be installed within the Avenue K right-of-way between 30<sup>th</sup> Street West and 30<sup>th</sup> Street East, in the City of Lancaster, Los Angeles County, California. The purpose of Earth Systems Southern California's (ESSC's) services was to evaluate the geotechnical engineering characteristics of the subsurface soils along the proposed water pipeline alignment relative to the anticipated development.

This report includes:

1. Descriptions of the field exploration and laboratory tests performed.
2. Conclusions and recommendations relating to construction of the proposed water line based upon analyses of data obtained from the exploration and testing programs and on knowledge of the general and geotechnical engineering characteristics of the project subsurface soils.

**PROJECT DESCRIPTION**

Based upon ESSC's discussions with Brockmeier Consulting Engineers, Inc., ESSC understands that plans are to install approximately 31,900 linear feet of new 36" diameter steel water transmission pipeline along Avenue K, between 30<sup>th</sup> Street West and 30<sup>th</sup> Street East. It is currently not known which side or pavement lane the waterline will be placed.

The proposed waterline will be installed in four phases. Phase I is located between 10<sup>th</sup> Street West and 5<sup>th</sup> Street East, Phase II between 5<sup>th</sup> Street East and 20<sup>th</sup> Street East, Phase III between 30<sup>th</sup> Street West and 10th Street West and Phase IV between 20<sup>th</sup> Street East and 30<sup>th</sup> Street East (see attached Site Plan). There is anticipated to be approximately five feet of cover over the pipeline.

It is anticipated that the majority of the proposed water line will be installed using conventional "cut and cover" construction techniques. However, the use of "trenchless" pipeline installation techniques may be required at major street intersections and under the existing Southern Pacific Railroad/Metrolink railroad tracks. These assumptions were used as the basis for the exploration, testing, and analyses programs, and for the recommendations contained in this report.

### PURPOSE AND SCOPE OF SERVICES

The purpose of ESSC's services was to evaluate the project soil conditions along the proposed alignment, and to provide preliminary geotechnical engineering conclusions and recommendations relative to the proposed development. ESSC's scope of services included the following:

- A. A general reconnaissance of the proposed alignment lines.
- B. Shallow subsurface exploration of the proposed alignment line by drilling 32 test borings.
- C. Geotechnical laboratory testing of selected soil samples obtained from the exploratory soil boring excavated for this project.
- D. Engineering analyses of the data obtained from the exploration and testing programs.
- E. A summary of our findings and recommendations in this written report.

Contained in this report are:

- 1. Discussions on local and project-specific soil conditions.
- 2. Results of laboratory tests and field data.
- 3. Recommendations relating to the proposed development including general soil and groundwater conditions along the proposed alignment, recommendations relative to trench excavations, trench sloping or shoring, trench backfill criteria, pipe bedding criteria, and soil corrosion potential.

### SITE DESCRIPTION

The proposed pipeline is to be installed in Avenue K, between 30<sup>th</sup> Street West and 30<sup>th</sup> Street East in the City of Lancaster, Los Angeles County, California (see attached Site Plan). Avenue K is a paved improved street with numerous cross-street intersections. Numerous utility lines and other improvements (medians, sidewalks, landscape planters, etc.) are present within this street and adjacent right-of-way. California State Highway 14/138 (Antelope Valley Freeway) crosses Avenue K via an overpass between 15<sup>th</sup> Street West and 17<sup>th</sup> Street West. Sierra Highway, another major north-south trending county arterial route crosses Avenue K at-grade at approximately 3<sup>rd</sup> Street West. Several parallel railroad tracks of the Southern Pacific Railroad/Metrolink railroad crosses Avenue K at-grade just east of Sierra Highway.

Topographically, the ground along the proposed alignment between 30<sup>th</sup> Street West and approximate 10<sup>th</sup> Street East is sloping to the north/northwest at an approximate one percent gradient. The ground along the proposed alignment between approximate 10<sup>th</sup> Street East and 30<sup>th</sup> Street East is sloping to the north/northeast at an approximate one percent gradient. The ground elevation at 30<sup>th</sup> Street West is approximately 2,390 feet while the ground elevation at 30<sup>th</sup> Street

East is approximately 2,425 feet. The above-cited descriptions are intended to be illustrative, and are specifically not intended for use as a legal description of the subject property.

### FIELD EXPLORATION

The field exploration for this study, conducted in January 2001, consisted of 32 exploratory soil borings drilled to depths of approximately 11 feet below the existing ground surface. Borings 1 through 8, inclusive, were drilled in the dirt shoulder along the south side of Avenue K. Boring 9 through 25, inclusive, and 27 through 32, inclusive, were drilled within the "center turning lane" of Avenue K. Boring 26 was drilled in the extreme southeast corner of the asphalt concrete parking lot of the City of Lancaster "Park and Ride" facility located on the north side of Avenue K just west of the Antelope Valley Freeway.

The borings were drilled with a CME 55 truck-mounted drilling rig using eight-inch diameter continuous flight hollow stem auger in accordance with generally accepted geotechnical exploration procedures (ASTM D 1452). The approximate location of the exploratory borings, as indicated on the attached Site Plan in Appendix A, were determined by sighting and pace measuring from existing streets and project improvements. The exploration locations should be considered accurate only to the degree implied by the measurement method used.

Bulk disturbed samples of the subsurface soils were obtained from tailings developed during excavation of the test boring. These samples were secured for classification and testing purposes and represent a mixture of soils within the noted depths.

Soil samples ("ring samples") were secured from within the soil borings using a three-inch O. D. ring sampler (ASTM D 3550). The sampler shoe is similar to the type specified in ASTM D 1586. A 140-pound hammer falling approximately 30 inches (ASTM D 1586) drove the sampler. The number of blows required to drive the sampler one-foot was recorded in six-inch increments. Recovered soil samples were sealed in plastic containers and brought to ESSC's laboratory for further classification and testing.

The Boring Logs for this report, included in Appendix A, represent ESSC's interpretation of the field logs prepared for each boring by our staff, along with their interpretation of soil conditions between samples and results of laboratory tests. While the noted stratification lines represent approximate boundaries between soil types, the actual transitions may be gradual.

### LABORATORY TESTING

After visual and tactile classification in the field, the soil samples were brought to our laboratory. The soil classifications were checked in accordance with the Unified Soil Classification System and a testing program was established as follows:

- A. Soil samples and field logs were reviewed to assess which samples would be analyzed further.

- B. In-situ moisture content and dry unit weight for soil core samples were developed in accordance with ASTM D 2937.
- C. The relative strength characteristics of the compacted near-surface soils were estimated from the results of direct shear tests (ASTM D 3080) conducted on samples remolded to approximately 90% of maximum dry density as determined by ASTM D 1557 test procedures. The remolded samples were placed in contact with water for at least 24 hours before testing and then sheared under normal loads ranging from approximately 0.5 to 2.3 KSF.
- D. The relative strength characteristics of the subsurface soils were estimated from the results of direct shear tests (ASTM D 3080) conducted on ring samples obtained from the ring sampler. The samples were placed in contact with water for at least 24 hours before testing and then sheared under normal loads ranging from 0.5 to 2.3 KSF.
- E. Soil classification tests consisted of Particle Size Analysis: Mechanical Method (ASTM D 422) and Sand Equivalent (California Test Method 217).
- F. Additional tests consisted of Maximum Density-Optimum Moisture (ASTM D 1557).

Refer to Appendix B for the laboratory test results. Presentation of the test results provides only that information considered pertinent. References to ASTM and other test standards refer to the standard currently in effect.

Soil chemistry tests consisted of sulfate, pH and Soil Resistivity, as well as several other chemical content tests. M. J. Schiff & Associates of Upland, California performed soil chemistry tests on samples of the encountered soils provided by ESSC. The results of these soil chemistry tests, along with a Soil Corrosivity Study are included in Appendix D.

### SURFACE AND SUBSURFACE SOIL CONDITIONS

As discussed in the Field Exploration section, Borings 1 through 8, inclusive, were drilled in the dirt shoulder along the south side of Avenue K. Boring 9 through 25, inclusive, and 27 through 32, inclusive, were drilled within the asphalt concrete pavement of the "center turning lane" of Avenue K. This pavement had a variable thickness of asphalt concrete and aggregate base material. Boring 26 was drilled in the extreme southeast corner of the asphalt concrete parking lot of the City of Lancaster "Park and Ride" facility located on the north side of Avenue K just west of the Antelope Valley Freeway; this pavement had asphalt concrete and aggregate base material.

Avenue K is a paved improved street with numerous cross-street intersections. Numerous utility lines and other improvements (medians, sidewalks, landscape planters, etc.) are present within this street and adjacent right-of-way.

The soils encountered in the exploratory borings are alluvial deposits, consisting of interbedded silty sands, relatively clean sands, clayey sands, sandy and clayey silts, and sandy and silty clays (SM, SP, SC, ML, and CL soil types based upon the Unified Soil Classification System). In general, the upper soils encountered east of 10<sup>th</sup> Street West were found to be more "coarse-grained" (SM, SC, and SP

soil types) in nature. While the upper soils encountered west of 10<sup>th</sup> Street West were found to contain significant amounts of "fines" (soil particles passing the #200 sieve), soils containing "fines" were also encountered east of 10<sup>th</sup> Street West. The upper "fine-grained" soils (ML and CL) encountered in the borings west of approximately 20<sup>th</sup> Street West were found to contain an abundant amount of calcium carbonate (locally referred to as "caliche") and were also found to be variably cemented.

Very moist to possibly saturated soils were encountered in several of the borings (see Borings B-12, B-14, B-15, B-16, B-17, B-18, B-21, B-23, B-24, B-28, and B-29). These very moist to possibly saturated soils were found to consist predominately of "fine-grained" silts and clays (ML and CL soil types). While no free groundwater was encountered in any of the borings, it may be possible that "seepage" may result from some of the encountered very moist to possibly saturated soils if excavations are left open from a period of time.

The majority of the sands (SM, SP, and SC soil types) encountered in the exploratory borings were found to be in a medium dense to dense condition. The majority of the fine-grained soils (ML and CL soil types) were found to be in a stiff to hard condition. No bedrock was encountered within the borings. The Boring Logs in Appendix A contain more detailed descriptions of the soils encountered in the exploratory test boring.

Based upon the direct shear test results, the native soils within the depths tested were found to have relatively low cohesive strength, and can be described as "non-cohesive". As such, all the soils encountered in the exploratory borings can be classified as Type "C" soils according to CAL/OSHA. Per 1997 UBC Table 16-J, the subgrade classification along the proposed alignment is a stiff soil profile (SD).

Sand Equivalent values of the soils tested at or near the anticipated pipe subgrade elevations ranged from 5 to 73. The soils with significant "fines" content (ML and CL soil types) have lower values than the more coarse-grained soils (SM, SP, and SC soil types). A Sand Equivalent of 30 or higher is typically required for water line pipe bedding material. Some of the tested soils had sand equivalent test results below 30.

### **GROUNDWATER**

Free groundwater was not encountered in the borings at the time of drilling. Static aquifer groundwater levels along the proposed alignment are estimated to be deeper than 50 feet below the existing surface (U. S. Geological Survey Water Data Report CA 93-5; Volume V: Groundwater Data, March 1993).

Very moist to possibly saturated soils were encountered in several of the borings (see section above). These very moist to possibly saturated soils were found to consist predominately of "fine-grained" silts and clays (ML and CL soil types). It may be possible that "seepage" may result from some of the encountered very moist to possibly saturated soils if excavations are left open from a period of time. Fluctuations in groundwater levels may occur due to variations in rainfall, regional climate, and other factors.

## REGIONAL GEOLOGY

The project is located in the south-central portion of the Antelope Valley. Lithologic units exposed in this area consist predominantly of deep Quaternary sediments. Local active faults are typically located along the margins of the Antelope Valley.

The San Andreas rift zone, which is several miles wide, dominates the geology of the southern Antelope Valley. The rift zone is an extensive zone of active and potentially active faults that extends from the Gulf of California to Cape Mendocino in northern California. The San Andreas fault, and associated subsidiary faults, is the closest active fault to the proposed pipeline alignment. The San Andreas fault, at its nearest point to the proposed pipeline alignment (30<sup>th</sup> Street West), is located approximately six miles southwest. No known active faults exist within or cross the proposed pipeline alignment.

## GEOLOGIC HAZARDS

Based on the project reconnaissance and a review of selected geologic references, the geologic hazards that could affect the proposed pipeline generally include seismically related hazards. These hazards are discussed below.

### Fault Rupture

No active faults have been mapped across the proposed pipeline alignment. Therefore, the potential hazard due to active fault ground rupture is considered minimal. The project is not located within an Alquist-Priolo Earthquake Fault Zone, as currently published by the State of California, which are defined by the California State Division of Mines and Geology to delineate known active or potentially active faults.

### Seismic Hazards

The project is located in Southern California, which is an active seismic area. The project is within Seismic Zone 4 as designated by the 1997 edition of the Uniform Building Code. Major historic earthquakes felt in the vicinity of Lancaster have usually originated from faults located outside the area. These include the 1857 Fort Tejon, 1872 Owens Valley, 1952 Arvin-Tehachapi, 1971 San Fernando, 1987 Whittier, 1992 Landers and Big Bear events, 1994 Northridge and 1999 Hector Mine earthquakes. Intense ground shaking from regional and local faults should be anticipated on this project.

### Liquefaction

Liquefaction is defined as a loss of strength of saturated cohesionless soil generally due to seismic shaking. Soil types most susceptible to liquefaction are loose, saturated silty to clean fine sands. Based on the field exploration, the shallow alluvial soils along the proposed alignment consist of sands that are generally in a medium dense to dense state, or stiff to hard silts and clays. Static groundwater depths along the alignment are greater than 50 feet. Where groundwater levels are greater than 50 feet deep, it is generally thought that surface damage from deeper liquefaction will not



occur. Therefore, since the static groundwater level along the alignment is greater than 50 feet deep and since the foundation soils are relatively dense/stiff in nature, it is our opinion that hazards from liquefaction on this project should be negligible.

### Ground Fissuring

Areal subsidence could also occur on the project, but would probably occur on a regional basis. Ground fissuring is a recently observed phenomenon in the northwest Lancaster area and at Edwards Air Force Base. It is thought to occur due to areal subsidence related to extensive groundwater withdrawal, tensional stresses, and erosion. Documented hazards from ground surface fissuring observed in other areas of California have included foundation distress and adverse settlement, as well as cracking of pavement and utilities.

At this time, the areas of predominant fissuring in the Antelope Valley are located north of Avenue I. ESSC is not aware of documented evidence of structural damage to buildings in the immediate area of the project attributed to the ground fissuring phenomena. ESSC personnel observed no obvious evidence of fissuring on this project at the time of our field exploration.

The location of ground fissuring in the Lancaster area appears to be related to specific soil types, relative location within the area of areal subsidence, and the potential for storm runoff to erode existing fissures. Accurate prediction of future areas of fissuring is beyond the current state of the art for this profession, especially as changes in groundwater pumping and location of well fields could alter the location and magnitude of areal subsidence and associated tensional stresses.

## DISCUSSION AND CONCLUSIONS

Based upon the field exploration, laboratory testing, ESSC's understanding of the proposed development, and past experience, it is ESSC's opinion that the proposed water line alignment, when modified as recommended in this report, is suitable for the intended construction.

### Ground Settlement

Two types of settlement can affect trenching projects. First, the ground behind shoring or shielding can settle, and second, the trench backfill can settle. The ground behind shoring or shielding can settle from two primary sources:

- 1) The ground can "yield" laterally and downward toward the shoring or shielding. This is often referred to as "ground loss".
- 2) Dewatering can increase stresses in dewatered soils, which results in consolidation.

Some ground loss will occur with a shield and other shoring systems. The magnitude of this loss varies widely and is difficult to predict. For the medium dense to dense sands encountered in the borings, it is estimated that the ground loss will be in the range of 1.0 percent near the trench, in the range of 0.5 percent at a distance "H" from the excavation, and to be negligible to a distance of "2H"

from the excavation: "H" is equal to the trench depth and ground loss is expressed as a percent of the trench depth.

Due to the depth to ground water within the project, dewatering of trenches is not anticipated for this project. Therefore, ground settlement from dewatering is not applicable to this project.

It should be noted that settlement of trench backfill is possible, even when the backfill is properly placed per the project backfill compaction specifications. Therefore, there is a potential for periodic reworking or resurfacing of the trench areas where the depth of backfill exceeds approximately five feet.

#### Groundwater and Trench Dewatering

No free groundwater was encountered within any of the exploratory borings to the maximum depth drilled. Therefore, no free groundwater related construction issues or trench dewatering are anticipated for this project.

Very moist to possibly saturated soils were encountered in several of the borings. These very moist to possibly saturated soils were found to consist predominately of "fine-grained" silts and clays (ML and CL soil types). It may be possible that "seepage" may result from some of the encountered very moist to possibly saturated soils if excavations are left open from a period of time. Depending upon the amount of seepage, it may be necessary to install sumps or temporary pumps to remove any localized seepage.

#### Trench Excavation and Wall Stability

The majority of the soils encountered in the exploratory borings consist of "non-cohesive" medium dense to dense sands (SM, SP, or SC soil types) or "low cohesive silts and clays (ML and CL soil types). As such, all the soils encountered in the exploratory borings can be classified as Type "C" soils according to CAL/OSHA. In addition, very moist to possibly saturated soils were encountered in several of the borings. **Due to the depth of the proposed water lines, the non-cohesive nature of the soils encountered, and nature of the soils encountered, sloping trench walls or side retention of trench excavations will be required in most areas of the project.** Trench excavations will require sloping, shoring, or shielding, or a combination, to comply with CAL/OSHA Construction Safety Orders for Excavation, Trenches, and Earthwork.

The CAL/OSHA Construction Safety Orders provide specific sloping requirements for Type "C" soils for trenches 20 feet or less in depth. Also provided in the Construction Safety Orders are timber and hydraulic shoring, shielding, and other methods of trench protection. A registered professional engineer must design protective systems for trenches greater than 20 feet in depth. The contractor should provide his own design for retaining structures and submit his design to the project engineer prior to construction.

The majority of the soils encountered along the proposed alignment should be excavatable with normal trench excavation equipment used for a project with the trench depths anticipated. Cemented fine-grained soils (locally referred to as "caliche") were encountered in the western portion of the proposed alignment (approximately west of 10<sup>th</sup> Street West) that may require special excavation techniques. No bedrock was encountered within the borings. Numerous utility lines and other improvements (medians, sidewalks, landscape planters, etc.) are present within Avenue K, adjacent cross-streets, and the adjacent right-of-way. All such improvements should be identified prior to trenching operations and be relocated as required.

#### Trench Bottom Stabilization and Bedding

Due to the relative dense and/or stiff nature of the soil encountered, the majority of the trench bottoms are anticipated to require only minor stabilization. Very moist to possibly saturated soils were encountered in several of the borings. Depending upon the nature of these soils at the time of excavation, stabilization of these soils may be required.

The sand equivalent values of the soils tested varied from 5 to 73. Standard specifications for pipeline construction call for pipe bedding material to have a sand equivalent value of 30 or higher. Some of the tested soils had sand equivalent test results below 30. Materials having the typical minimum sand equivalent were encountered at isolated locations along the proposed alignment. It may be possible to stockpile acceptable pipe bedding material for use along the alignment. However, care will have to be utilized in collecting and segregating these materials to prevent possible contamination with other undesirable soil encountered with sand equivalents of less than 30.

### RECOMMENDATIONS

Based upon the field exploration, laboratory testing, our interpretation of data from the exploration and testing programs, and past experience, it is our opinion that the following recommendations should be incorporated into preparation, design, and construction of the proposed pipeline.

#### A. Pipeline Excavations

1. Prior to trench excavations, any existing pavements, foundations, vegetation, trash piles, underground utilities, and other debris should be removed from along the proposed trench alignment. Numerous utility lines and other improvements (medians, sidewalks, landscape planters, etc.) are present within Avenue K and the adjacent right-of-way. It is possible that underground facilities may be encountered along the proposed pipeline alignment. All such improvements should be identified prior to trenching operations and be relocated as required. All strippings and debris should be removed from the construction area in order to preclude their incorporation into trench excavation backfill.
2. All project excavations should be made in accordance with applicable regulations (including CAL/OSHA). Project safety is the responsibility of the contractor and the owner. ESSC will not be responsible for project safety.

3. Due to the depth of the proposed water lines, the non-cohesive nature of the soils encountered, and nature of some of the soils encountered, sloping trench walls or side retention of trench excavations will be required in most, if not all, areas of the project.
4. Open excavations are **not** expected to stand even for a short period of time. All vertical excavations should be shored or provided with shielding. It will probably not be possible to vertically excavate the trench to full depth without potential caving of sidewalls, therefore it is our opinion that shoring or shielding will have to be installed and extended downward as the trench is excavated if vertical side walls are required. Where there is sufficient room, excavated sidewalls should be sloped back from the base of the excavation in accordance with CAL/OSHA guidelines. As excavations dry out, some sloughing will occur.
5. The lateral loads to be resisted by shoring or shielding may be calculated by using the data and method described on Plates C-I through C-IV of Appendix C. These design plates are provided for each Phase of the proposed pipeline installation.
6. Once trench excavations have been made to the planned depth below the pipe invert, the project engineer or governing agency should review the exposed surface to verify stability. If the trench bottom is unsatisfactory, stabilization should be effected. No pipe and/or backfill should be placed unless the trench has a firm, unyielding bottom.
7. Care should be taken by the contractor not to "over dig" the trench bottom. If the trench is excavated below the pipe invert for any reason, it should be refilled to the appropriate elevation with compacted bedding material.
8. During the time excavations are open, no heavy grading equipment or other surcharge loads (i.e. excavation spoils) should be allowed within a horizontal distance from the top of any slope equal to the depth of the excavation (both distances measured from the top of the excavation slope). Surcharge loads closer than this distance should be considered in the shoring or shielding design.
9. Measures should be taken to protect any structural foundations, pavements, or utilities adjacent to any excavations. If there are sensitive structures adjacent to or nearby the proposed trench excavations, the property owners, client, water district, and contractor should address these individually. Monitoring of such structures prior to and during construction is recommended.

B. Pipeline Subgrade Preparation and Trench Backfill

1. Soils at the base of the trench excavations (at pipe subgrade), to a depth of at least 12 inches, should be moisture conditioned to near optimum moisture content and be uniformly compacted to at least 90% of maximum dry density per ASTM D 1557 test procedures, prior to placement of pipe bedding material.

2. If unstable or spongy soils are such that removing them to firm soils is not possible or reasonable, the following trench bottom stabilization procedures are recommended:
  - a. Place 12 inches of crushed rock on the excavation bottom and compact it. Gradation of the rock should be such that no more than five percent by weight passes the #200 sieve.
  - b. Place a layer of geotextile fabric (Mirafi 600x™ or equivalent) on top of the rock layer and extend it upward along the trench a minimum of 12 inches.
  - c. Place a minimum six-inch layer of bedding material over the geotextile fabric. After the pipe is laid, the bedding material should extend to at least the spring line of the pipe.
3. Pipe bedding material should be placed and compacted in accordance with the manufacturers or governing agency's requirements. Except where otherwise specified by the pipe manufacturer or governing agency, the pipe bedding material should be clean sand, gravel, crushed aggregate, or native free-draining granular material having a sand equivalent of not less than 30. Based upon the sand equivalent tests performed for this report, select native soils may be useable as pipe bedding material.
4. Excavated soils encountered along the proposed alignment are usable as trench backfill, when cleaned of any trash, deleterious materials, and gravels larger than six inches.
5. Any import soils used as trench backfill should be equal to, or better than, the project soils in strength, expansion, compressibility, and soil chemistry characteristics. In general, import material should be free of organic matter and deleterious substances, have 100% passing a two-inch sieve, 60% to 100% passing a #4 sieve, no more than 20% passing a #200 sieve, an Expansion Index less than 20, and a Sand Equivalent of not less than 20. Import soils can be evaluated prior to their use, but will not be prequalified by the geotechnical consultant. Approval of import soils will be given only after the material is on the project, either in-place, or stockpiled in adequate quantity to complete the project.
6. Suitable fill soils should be moisture conditioned to near optimum moisture content and be uniformly compacted to at least 90% of maximum dry density as determined by ASTM D 1557 test procedures using mechanical compaction equipment. To aid in the compaction operation, fill should be placed in maximum six-inch compacted lifts.
7. Shrinkage because of excavation and compaction of the upper project soils is expected to be 10 to 15 percent of any excavated or scarified project soils. This estimate is based upon compactive effort needed to produce an average degree of compaction of approximately 92 percent and may vary depending on contractor methods. Losses from project clearing and pavement removal operations may affect quantity calculations and should also be taken into account. The pipeline contractor should verify shrinkage and earthwork yardage estimates.

8. Caution should be exercised in backfilling operations so that the newly installed pipe and any existing (adjoining) utilities are not damaged: heavy impact equipment should be discouraged.
9. Pavement should be neatly saw-cut behind any broken edges and removed. The replacement of any street structural section, as well as subgrade preparation, should be in accordance with the requirements of the governing agency. Included in Appendix D are City of Lancaster street repair guidelines (Plans EP-1 through EP-6).
10. Final project grades should be designed and constructed so that all water is diverted away from all structures and not allowed to pond on or near pavement.
11. It is recommended that Earth Systems Southern California (ESSC) be retained to provide engineering services during the grading, excavation, and backfill phases of development. This continuity of services will allow for the geotechnical review of the design concepts and specifications relative to the recommendations of this report and will more readily allow for design changes in the event that subsurface conditions differ from those currently anticipated.

### C. Foundations and Lateral Earth Pressures

1. It is recommended that any structure constructed on this project be designed to at least the minimum standards for Seismic Zone 4 as designated by the 1997 edition of the Uniform Building Code. The following Table is a summary of the estimated seismic parameters typically required for structural design per the 1997 UBC.

TABLE I  
Summary of Seismic Parameters

Seismic Zone	4
Seismic Source Type (1997 UBC Table 16-U)	A*
*San Andreas Fault	
Subgrade Classification (1997 UBC Table 16-J)	S <sub>D</sub>
Seismic Zone Factor "Z" (Table 16-I)	0.4
Seismic Coefficient - C <sub>s</sub> (1997 UBC Table 16-Q)	0.44N <sub>s</sub>
Seismic Coefficient - C <sub>v</sub> (1997 UBC Table 16-R)	0.64N <sub>v</sub>
Near Source Factor - N <sub>s</sub> (1997 UBC Table 16-S)	1.2
Near Source Factor - N <sub>v</sub> (1997 UBC Table 16-T)	1.6

2. Pipeline connections should be designed to allow for anticipated seismic shaking.
3. Excavations for thrust blocks or foundation construction should be cleaned of all loose or unsuitable soils and debris prior to placement of concrete.

4. An allowable "net" bearing capacity of 2,000 p.s.f. can be utilized for dead and sustained live loads of anticipated foundations or thrust blocks. This value includes a minimum safety factor of three, and may be increased by 1/3 for total loads, including seismic forces. Actual depth, width, and reinforcement requirements for thrust foundations will be dependent on applicable sections of the governing building code and requirements of the structural engineer.
5. The coefficient of friction between concrete pipe and soil or the vertical sides of thrust blocks was estimated to be 0.30 for undisturbed soils or project soils recompact to approximately 90% of maximum dry density as determined by ASTM D 1557 test methods, and may be used with dead loads. This value includes a reduction factor of 1/3. This value may be increased by 1/3 for total loads, including seismic forces.
6. Additional resistance to lateral loading may be provided by passive earth pressure acting against the sides of foundations or thrust blocks. This pressure was estimated to be 300 Z PSF, where Z = Depth (in feet) below the finished ground elevation. In passive pressure calculations, the upper one-foot of soil should be subtracted from the depth, Z, unless confined by pavement or slab. The resisting pressure provided is an ultimate value. An appropriate factor of safety should be used for design calculations (minimum of 1.5 recommended). The value used for design may be increased by 1/3 for total loads, including seismic forces. Passive and frictional resistance can be combined without reduction.

#### D. Soil Chemical Testing

1. It is recommended that a Type II Portland Cement be used in the concrete for the proposed thrust blocks foundations, pipe encasement, and drainage structures of this project.
2. Soil chemistry tests consisted of sulfate, pH and Soil Resistivity, as well as several other chemical content tests. M. J. Schiff & Associates of Upland, California performed soil chemistry tests on samples of the project soils provided by ESSC. The results of these soil chemistry tests, along with a Soil Corrosivity Study are included in Appendix D.
3. Tests should be conducted during grading operations to verify the soil chemistry of the soils used, especially if the soils are thoroughly mixed and additional fill is added during project construction operations.

#### CLIENT OPTIONAL SERVICES

This report was based on the assumption that an adequate program of client consultation, construction monitoring, and testing will be performed during the final design and construction phases to check conformance with the recommendations of this report. Maintaining ESSC as the

geotechnical engineering consultant from beginning to end of this project will help provide continuity of services. The recommended services include, but are not necessarily limited to, the following:

- a. Consultation as required during the final design stages of the project.
- b. Review of grading and/or project improvement plans.
- c. Observation and testing during project preparation, grading, and placement of engineered fill or backfill.
- d. Consultation as required during construction.

### LIMITATIONS AND UNIFORMITY OF CONDITIONS

The conclusions and recommendations submitted in this report relative to the proposed development are based, in part, upon the data obtained from eight exploratory soil borings, observations during the field exploration operations, and past experience. The nature and extent of variations between subsurface soil conditions may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.

In the event of any change in the assumed nature or design of the proposed project as planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report modified or verified in writing. This report is issued with the understanding that it is the responsibility of Brockmeier Consulting Engineers, Inc. or of their representatives, to insure that the information and recommendations contained in this report are called to the attention of the architects and engineers for the project and incorporated into the plan. It is also the responsibility of Brockmeier Consulting Engineers, Inc. or of their representatives, to insure that the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

As the geotechnical engineers for this project ESSC strives to provide our services in accordance with generally accepted geotechnical engineering practices in this community at this time. No warranty or guarantee is expressed or implied. This report was prepared for the exclusive use of Brockmeier Consulting Engineers, Inc. and their authorized agents.

It is recommended that ESSC be provided the opportunity for a general review of final design and specifications in order that earthwork and foundation recommendations may be properly interpreted and implemented in the design specifications. If ESSC is not accorded the privilege of making this recommended review, we can assume no responsibility for misinterpretation of our recommendations.

The scope of our current services for this report did not include any environmental assessment or investigation for the presence or absence of wetlands, or hazardous or toxic materials in the soil, surface water, groundwater or air, on or below or around the project.



The statements contained in this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they are due to natural processes or to the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur, whether they result from legislation or the broadening of knowledge. Accordingly, the conclusions of this report may be invalidated, wholly or partially, by changes outside of our control, and should therefore be reviewed after one year.

### CLOSURE

Earth Systems Southern California trusts this report is sufficient at this time and meets your current needs and appreciates this opportunity to provide professional geotechnical engineering services for this project. If you have any questions regarding the information contained in this report, or if you require additional geotechnical engineering services, please contact us.

Respectfully submitted,

Earth Systems  
Southern California



Bruce A. Hick  
Geotechnical Engineer  
R. G. E. #2284



APPENDIX A

Site Plan

Boring Logs



# TERMS DESCRIBING CONSISTENCY OR CONDITION

## COARSE GRAINED SOILS

(Major Portion Retained on Number 200 Sieve)

Includes clean gravels and sands described as fine, medium or coarse, depending on distribution of grain sizes, and silty or clayey gravels and sands, condition is rated according to laboratory tests or estimated from resistance to sampler penetration.

Penetration Resistance\*  
California Split Spoon (CSS)  
Blows/Ft

0-5  
5-15  
15-40  
40-70  
>70

Very Loose  
Loose  
Medium Dense  
Dense  
Very Dense

Penetration Resistance\*  
Standard Pentrometer  
(SPT)  
Blows/Ft

0-4  
5-10  
11-30  
31-50  
>50

## Fine Grained Soils

(Major Portion Passing the Number 200 Sieve)

Includes inorganic and organic silts and clays, gravelly, sandy or silty clays, and clayey silts. Consistency is rated according to laboratory tests or estimated from resistance to sampler penetration.

Penetration Resistance\*  
California Split Spoon  
(CSS)  
Blows/Ft

0-2  
2-5  
6-10  
11-18  
19-36  
>36

Very Soft  
Soft  
Medium Stiff  
Stiff  
Very Stiff  
Hard

Penetration Resistance\*  
Standard Pentrometer  
(SPT)  
Blows/Ft

0-2  
2-4  
5-8  
9-15  
16-30  
>30

\* Penetration resistance based on a 140 pound hammer falling approximately 30 inches.

**Apparent Density/Consistency of Soil**
















**Avenue K Transmission Line  
Lancaster, California**



**Earth Systems  
Southern California**

2/09/01

PL-05531-01

MAJOR DIVISIONS			GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS  MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS  MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SAND AND SANDY SOILS  MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	CLEAN SAND (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS  MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS  LIQUID LIMIT LESS THAN 50			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS  LIQUID LIMIT GREATER THAN 50			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGAINC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENT

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

## UNIFIED SOIL CLASSIFICATION SYSTEM

Avenue K Transmission Line

Lancaster, California



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2/09/01

PL-05531-01

## SYMBOLS COMMONLY USED ON BORING LOGS



Modified California Split Barrel Sampler



Modified California Split Barrel Sampler - No Recovery



Standard Penetration Test (SPT) Sampler



Standard Penetration Test (SPT) Sampler - No Recovery



Perched Water Level



Water Level First Encountered



Water Level After Drilling



Pocket Penetrometer (tsf)



Vane Shear (ksf)

1. The location of borings were approximately determined by pacing and/or siting from visible features. Elevations of borings are approximately determined by interpolating between plan contours. The location and elevation of the borings should be considered accurate only to the degree implied by the method used.
2. The stratification lines represent the approximate boundary between soil types and the transition may be gradual.
3. Water level readings have been made in the drill holes at times and under conditions stated on the boring logs. This data has been reviewed and interpretations made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, tides, temperature, and other factors at the time measurements were made.

### BORING LOG SYMBOLS

Avenue K Transmission Line  
Lancaster, California



**Earth Systems**  
**Southern California**

2/9/01

PL-05531-01



<b>Boring No: 1</b> Project Name: Avenue K Transmission Line Project Number: PL-05531-01 Boring Location: Per Plan						<b>Drilling Date: January 4, 2001</b> <b>Drilling Method: Hollow Stem</b> <b>Drill Type: CME 55</b> <b>Logged By: Rob Ferguson</b>		
Depth (Ft.)	Sample Type		Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pct)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT						
0					SM			Dark Yellow Brown Silty Fine to Medium Sand, Dry, Medium Dense.
			9,12		SM	106.8	2.4	
5			8,9		SM	110.6	1.9	Dark Yellow Brown Silty Fine to Coarse Sand, Dry, Medium Dense.
			6,9		SP			Pale Yellow Brown Slightly Silty Fine to Coarse Sand with Gravel to 1", Dry, Medium Dense.
10			9,13			112.0	1.2	
								Total Depth = 11'
								No Bedrock encountered during drilling.
								No free groundwater encountered during drilling.
15								Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.



Boring No: 2					Drilling Date: January 4, 2001			
Project Name: Avenue K Transmission Line					Drilling Method: Hollow Stem			
Project Number: PL-05531-01					Drill Type: CME 55			
Boring Location: Per Plan					Logged By: Rob Ferguson			
Depth (Ft.)	Sample Type		Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT						
0					SM			Moderate Yellow Brown Very Silty Fine to Medium Sand, Dry, Medium Dense.
			22,12			110.9	1.2	
5			5,7		SP			Pale Yellow Brown Slightly Silty Fine to Coarse Sand with Gravel to 1", Dry, Loose.
			11,14		SP			Pale Yellow Brown Slightly Silty Fine to Coarse Sand with Gravel to 1", Dry, Medium Dense.
10			7,10					
15								Total Depth = 11'
								No Bedrock encountered during drilling.
								No free groundwater encountered during drilling.
								Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.





Boring No: 3						Drilling Date: January 4, 2001		
Project Name: Avenue K Transmission Line						Drilling Method: Hollow Stem		
Project Number: PL-05531-01						Drill Type: CME 55		
Boring Location: Per Plan						Logged By: Rob Ferguson		
Depth (Ft.)	Sample Type		Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pct)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT						
		MOD Calif.						
0					ML			Pale Yellow Brown Fine Sandy Silt, Moist, Hard.
			16,33			100.3	10.7	
5			19,22		SM	114.6	4.3	Moderate Yellow Brown Very Silty Fine to Medium Sand, Moist, Dense.
			9,15		SM	114.2	4.9	Moderate Yellow Brown Silty Fine to Coarse Sand, Slightly Moist, Medium Dense.
10			8,9		SM	106.4	4.7	Dark Yellow Brown Silty Fine to Medium Sand, Moist, Medium Dense.
15								Total Depth = 11'
								No Bedrock encountered during drilling.
								No free groundwater encountered during drilling.
								Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.



Boring No: 4  
Project Name: Avenue K Transmission Line  
Project Number: PL-05531-01  
Boring Location: Per Plan

Drilling Date: January 4, 2001  
Drilling Method: Hollow Stem  
Drill Type: CME 55  
Logged By: Rob Ferguson

Depth (Ft.)	Sample Type			Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT	MOD Calif.						
0						SM			Dark Yellow Brown Silty Fine to Coarse Sand, Dry, Medium Dense.
			11,13			SM	117.2	0.7	
5			16,27			SM	*****	1.2	Dark Yellow Brown Silty Fine to Coarse Sand, Dry, Dense.
			15,19			ML	112.0	4.5	Moderate Yellow Brown Fine to Medium Sandy Silt, Moist, Very Stiff.
10			13,17			SM	104.6	1.5	Moderate Yellow Brown Silty Fine to Coarse Sand, Dry, Medium Dense.
15									<p>Total Depth = 11'</p> <p>No Bedrock encountered during drilling.</p> <p>No free groundwater encountered during drilling.</p> <p>Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.</p>



<b>Boring No: 5</b>	<b>Drilling Date: January 4, 2001</b>
<b>Project Name: Avenue K Transmission Line</b>	<b>Drilling Method: Hollow Stem</b>
<b>Project Number: PL-05531-01</b>	<b>Drill Type: CME 55</b>
<b>Boring Location: Per Plan</b>	<b>Logged By: Rob Ferguson</b>

Depth (Ft.)	Sample Type			Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT	MOD Calif.						
0						SM			Moderate Yellow Brown Silty Fine Sand, Moist, Medium Dense.
				10,13			108.1	4.4	
						SM			Moderate Yellow Brown Silty Fine to Medium Sand, Moist, Medium Dense.
5				11,13			106.3	4.6	
						SM			Dark Yellow Brown Very Silty Fine Sand, Dry, Medium Dense.
				8,10			110.0	2.1	
10				8,11		SM	*****	5.9	Pale Yellow Brown Very Silty Fine Sand, Moist, Medium Dense.
									Total Depth = 11'
									No Bedrock encountered during drilling.
									No free groundwater encountered during drilling.
15									Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.



Boring No: 6 Project Name: Avenue K Transmission Line Project Number: PL-05531-01 Boring Location: Per Plan						Drilling Date: January 4, 2001 Drilling Method: Hollow Stem Drill Type: CME 55 Logged By: Rob Ferguson			
Depth (Ft.)	Sample Type			Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT	MOD Calif.						
0						ML			Dark Yellow Brown Fine Sandy Silt, Slightly Moist, Very Stiff.
				8,12			97.4	2.8	
						SM			Dark Yellow Brown Slightly Silty Fine to Medium Sand, Dry, Medium Dense.
5				9,14			115.1	1.4	
						SM			Moderate Yellow Brown Silty Fine to Coarse Sand, Dry, Loose.
				6,8			*****	1.6	
						SM			Dark Yellow Brown Silty Fine to Coarse Sand, Dry, Medium Dense.
10				8,14			105.1	1.7	
									Total Depth = 11'
									No Bedrock encountered during drilling.
									No free groundwater encountered during drilling.
15									Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.



Boring No: 7					Drilling Date: January 4, 2001			
Project Name: Avenue K Transmission Line					Drilling Method: Hollow Stem			
Project Number: PL-05531-01					Drill Type: CME 55			
Boring Location: Per Plan					Logged By: Rob Ferguson			
Depth (Ft.)	Sample Type		Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pct)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT						
0					SM			Dark Yellow Brown Silty Fine Sand, Dry, Medium Dense.
			7,9			103.1	1.7	
					SM			Dark Yellow Brown Silty Fine to Medium Sand, Dry, Loose.
5			6,8			109.1	2.1	
					SM			Dark Yellow Brown Silty Fine to Coarse Sand with Gravel to 3/4", Dry, Medium Dense.
			5,7			105.9	1.6	
10			9,11			110.4	2.0	Total Depth = 11'  No Bedrock encountered during drilling.  No free groundwater encountered during drilling.  Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.
15								



Boring No: 8  
Project Name: Avenue K Transmission Line  
Project Number: PL-05531-01  
Boring Location: Per Plan

Drilling Date: January 4, 2001  
Drilling Method: Hollow Stem  
Drill Type: CME 55  
Logged By: Rob Ferguson

Depth (Ft.)	Sample Type			Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT	MOD Calif						
0						SM			Dark Yellow Brown Very Silty Fine Sand, Slightly Moist, Medium Dense.
				6,9			105.0	2.9	
						SM			Dark Yellow Brown Silty Fine to Medium Sand, Dry, Medium Dense.
5				7,9			113.0	1.5	
						SM			Pale Yellow Brown Silty Fine to Coarse Sand with Gravel to 3/4", Dry, Medium Dense.
				7,10			110.1	1.7	
10				7,12			106.0	3.0	
									Total Depth = 11'
									No Bedrock encountered during drilling.
15									No free groundwater encountered during drilling.
									Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.



Boring No: 9  
Project Name: Avenue K Transmission Line  
Project Number: PL-05531-01  
Boring Location: Per Plan

Drilling Date: January 4, 2001  
Drilling Method: Hollow Stem  
Drill Type: CME 55  
Logged By: Rob Ferguson

Depth (Ft.)	Sample Type		Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT						
0					SM			Dark Yellow Brown Silty Fine Sand, Moist. Loose.
			3,5			102.0	10.4	
					SM			Dark Yellow Brown Silty Fine to Medium Sand, Slightly Moist, Loose.
5			5,5			105.6	2.5	
					ML			Dark Yellow Brown Fine Sandy Silt, Moist, Stiff.
			6,7			100.7	7.2	
					ML			Dark Yellow Brown Fine Sandy Silt, Moist, Very Stiff.
10			5,12			109.5	6.8	
								Total Depth = 11'
								No Bedrock encountered during drilling.
								No free groundwater encountered during drilling.
15								Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.







Boring No: 10  
Project Name: Avenue K Transmission Line  
Project Number: PL-05531-01  
Boring Location: Per Plan

Drilling Date: January 4, 2001  
Drilling Method: Hollow Stem  
Drill Type: CME 55  
Logged By: Rob Ferguson

Depth (Ft.)	Sample Type		Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pct)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT						
0					ML			Dark Yellow Brown Fine Sandy Silt, Moist, Medium Stiff.
			5,3			104.0	9.7	
					ML			Dark Yellow Brown Fine Sandy Silt, Moist, Stiff.
5			4,7			117.9	10.4	
					SM			Dark Yellow Brown Silty Fine to Coarse Sand, Slightly Moist, Medium Dense.
			5,12			113.2	2.9	
10			7,9			105.2	2.5	
								Total Depth = 11'
								No Bedrock encountered during drilling.
15								No free groundwater encountered during drilling.
								Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.





Boring No: 11 Project Name: Avenue K Transmission Line Project Number: PL-05531-01 Boring Location: Per Plan							Drilling Date: January 4, 2001 Drilling Method: Hollow Stem Drill Type: CME 55 Logged By: Rob Ferguson		
Depth (Ft.)	Sample Type			Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pct)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT	MOD Calif.						
0				7,8		SM	104.3	4.3	Dark Yellow Brown Very Silty Fine Sand, Moist, Medium Dense.
5				5,6		ML	91.0	9.2	Dark Yellow Brown Fine Sandy Silt, Moist, Stiff.
				4,6		SM	94.7	6.3	Moderate Yellow Brown Very Silty Fine Sand, Moist, Loose.
10				4,5		SM	99.0	6.9	Moderate Yellow Brown Very Silty Fine Sand, Moist, Loose.
15	Total Depth = 11'  No Bedrock encountered during drilling.  No free groundwater encountered during drilling.  Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.								



Boring No: 12  
Project Name: Avenue K Transmission Line  
Project Number: PL-05531-01  
Boring Location: Per Plan

Drilling Date: January 5, 2001  
Drilling Method: Hollow Stem  
Drill Type: CME 55  
Logged By: Rob Ferguson

Depth (Ft.)	Sample Type			Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pct)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT	MOD Calif.						
0						SM			Moderate Brown Silty Fine to Medium Sand, Moist, Medium Dense.
				9,9			110.5	6.1	
						ML			Dark Yellow Brown Fine Sandy Silt with Clay, Moist, Medium Stiff.
5				3,6			99.3	12.1	
				4,7			100.6	11.4	
						ML			Dark Yellow Brown Fine Sandy Silt, Wet, Medium Stiff.
10				4,8					
									Total Depth = 11'
									No Bedrock encountered during drilling.
									No free groundwater encountered during drilling.
15									Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.



Boring No: 13  
Project Name: Avenue K Transmission Line  
Project Number: PL-05531-01  
Boring Location: Per Plan

Drilling Date: January 5, 2001  
Drilling Method: Hollow Stem  
Drill Type: CME 55  
Logged By: Rob Ferguson

Depth (Ft.)	Sample Type			Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT	MOD Calif.						
0						SM			Moderate Brown Silty Fine to Medium Sand, Moist, Medium Dense.
				8,7			108.1	6.7	
						SM			Moderate Yellow Brown Silty Fine to Medium Sand. Slightly Moist, Medium Dense.
5				8,9			106.9	3.8	
						SP			Moderate Yellow Brown Slightly Silty Fine Sand, Dry, Loose.
				7,7			104.9	2.5	
						SM			Moderate Yellow Brown Silty Fine to Coarse Sand with Slight Gravel to 1/2", Dry, Medium Dense.
10				10,13			114.7	2.4	
									<p>Total Depth = 11'</p> <p>No Bedrock encountered during drilling.</p> <p>No free groundwater encountered during drilling.</p> <p>Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.</p>
15									



Boring No: 14  
Project Name: Avenue K Transmission Line  
Project Number: PL-05531-01  
Boring Location: Per Plan

Drilling Date: January 5, 2001  
Drilling Method: Hollow Stem  
Drill Type: CME 55  
Logged By: Rob Ferguson

Depth (Ft.)	Sample Type		Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT						
0					ML			Moderate Brown Fine Sandy Silt, Wet, Stiff.
			7,6			96.1	9.6	
5			5,6		SM	111.0	5.7	Dark Yellow Brown Silty Fine to Medium Sand with Slight Gravel to 1/2", Moist, Loose.
			8,12		SP	117.2	2.3	Moderate Brown Gravely Fine to Coarse Sand with Slight Silt, Dry, Medium Dense.
10			11,18		CL	111.6	16.6	Moderate Brown Silty Clay with Calcium Carbonate Stringers, Moist, Stiff.
15								Total Depth = 11'
								No Bedrock encountered during drilling.
								No free groundwater encountered during drilling.
								Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.



Boring No: 15  
Project Name: Avenue K Transmission Line  
Project Number: PL-05531-01  
Boring Location: Per Plan

Drilling Date: January 5, 2001  
Drilling Method: Hollow Stem  
Drill Type: CME 55  
Logged By: Rob Ferguson

Depth (Ft.)	Sample Type			Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pct)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT	MOD Calif.						
0						SM			Moderate Brown Silty Fine Sand, Moist, Loose.
			6,8				111.3	5.3	
						SM			Moderate Brown Silty Fine to Coarse Sand, Slightly Moist, Loose.
5			5,9				118.4	3.8	
						ML			Moderate Brown Fine Sandy Silt, Wet, Stiff.
			12,20				*****	10.1	
10			11,18				117.0	14.4	Total Depth = 11'  No Bedrock encountered during drilling.  No free groundwater encountered during drilling.  Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.
15									



**Boring No: 19**  
**Project Name: Avenue K Transmission Line**  
**Project Number: PL-05531-01**  
**Boring Location: Per Plan**

**Drilling Date: January 5, 2001**  
**Drilling Method: Hollow Stem**  
**Drill Type: CME 55**  
**Logged By: Rob Ferguson**

Depth (Ft.)	Sample Type			Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT	MOD Calif.						
0						SM			Dark Yellow Brown Silty Fine to Medium Sand with Clay, Moist to Wet, Loose.
				4,6			107.5	11.6	
						SM			Moderate Yellow Brown Silty Fine to Coarse Sand, Moist, Loose.
5				5,7			106.6	3.5	
						SP			Pale Yellow Brown Gravely Fine to Coarse Sand with Slight Silt, Slightly Moist, Loose.
				7,9			106.6	2.6	
						SM			Dark Yellow Brown Very Silty Fine to Coarse Sand with Gravel to 1/2", Moist, Medium Dense.
10				15,20			114.2	4.2	
									<p>Total Depth = 11'</p> <p>No Bedrock encountered during drilling.</p> <p>No free groundwater encountered during drilling.</p> <p>Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.</p>
15									



Boring No: 20  
Project Name: Avenue K Transmission Line  
Project Number: PL-05531-01  
Boring Location: Per Plan

Drilling Date: January 8, 2001  
Drilling Method: Hollow Stem  
Drill Type: CME 55  
Logged By: Rob Ferguson

Depth (Ft.)	Sample Type		Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pct)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT						
0					ML			Dark Yellow Brown Fine Sandy Silt with Clay, Moist to Wet, Soft.
			3,3			100.8	12.7	
5			4,6		SP	108.3	3.6	Moderate Brown Slightly Silty Fine to Coarse Sand with Clay, Slightly Moist, Loose.
			10,10		SP	108.7	3.2	Pale Brown Slightly Silty Fine to Coarse Sand, Slightly Moist, Medium Dense.
10			6,8		SP	106.1	3.7	Dark Yellow Brown Slightly Silty Fine to Coarse Sand with Gravel to 1 1/2", Slightly Moist, Loose.
15								Total Depth = 11'
								No Bedrock encountered during drilling.
								No free groundwater encountered during drilling.
								Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.



Boring No: 21  
Project Name: Avenue K Transmission Line  
Project Number: PL-05531-01  
Boring Location: Per Plan

Drilling Date: January 5, 2001  
Drilling Method: Hollow Stem  
Drill Type: CME 55  
Logged By: Rob Ferguson

Depth (Ft.)	Sample Type		Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pct)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT						
0								
					CL			Dark Yellow Brown Fine Sandy Clay with Silt, Moist to Wet, Medium Stiff.
			3,4			102.1	18.1	
					CL			Dark Yellow Brown Silty Clay with Fine Sand, Saturated, Medium Stiff.
5			4,5			105.8	20.3	
					ML			Dark Yellow Brown Fine Sandy Silt with Clay and Gravel, Moist, Medium Stiff.
			4,5			98.4	10.9	
					SM			Dark Yellow Brown Silty Fine to Medium Sand, Moist, Loose.
10			5,7			101.3	6.7	
								Total Depth = 11'
								No Bedrock encountered during drilling.
								No free groundwater encountered during drilling.
15								Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.





Boring No: 22  
Project Name: Avenue K Transmission Line  
Project Number: PL-05531-01  
Boring Location: Per Plan

Drilling Date: January 8, 2001  
Drilling Method: Hollow Stem  
Drill Type: CME 55  
Logged By: Rob Ferguson

Depth (Ft.)	Sample Type			Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pct)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT	MOD Calif.						
0						ML			Dark Yellow Brown Clayey Silt, Moist to Wet, Medium Stiff.
				4,4			97.3	21.4	
						SM			Dark Yellow Brown Very Silty Fine to Medium Sand, Moist to Wet, Loose.
5				3,4			97.0	13.1	
						ML			Dark Yellow Brown Fine Sandy Silt, Moist, Stiff.
				5,6			103.0	16.9	
						ML			Dark Yellow Brown Fine Sandy Silt, Moist to Wet, Very Stiff.
10				6,23			84.8	23.1	
									Total Depth = 11'  No Bedrock encountered during drilling.  No free groundwater encountered during drilling.  Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.
15									



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Drilling Date: January 8, 2001  
Drilling Method: Hollow Stem  
Drill Type: CME 55  
Logged By: Rob Ferguson

Depth (Ft.)	Sample Type		Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk SPT	MOD Calif.						
0					SM			Dark Yellow Brown Silty Fine to Coarse Sand with Gravel to 3/8", Moist to Wet, Medium Dense.
			6,9			114.8	9.6	
					SM			Dark Yellow Brown Silty Fine to Medium Sand, Slightly Moist, Loose.
5			4,6			105.4	4.7	
			10,20		CL	*****	35.4	Dark Yellow Brown Fine Sandy Clay with Silt, Saturated, Very Stiff.
10			10,19		CL	104.2	18.8	Pale Yellow Brown Fine Sandy Clay with Silt, Wet, Very Stiff.
								Total Depth = 11'
								No Bedrock encountered during drilling.
								No free groundwater encountered during drilling.
15								Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.



**Boring No: 24**  
**Project Name: Avenue K Transmission Line**  
**Project Number: PL-05531-01**  
**Boring Location: Per Plan**

**Drilling Date: January 8, 2001**  
**Drilling Method: Hollow Stem**  
**Drill Type: CME 55**  
**Logged By: Rob Ferguson**

Depth (Ft.)	Sample Type			Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT	MOD Calif.						
0						ML			Dark Yellow Brown Fine to Medium Sandy Silt with Clay, Moist, Stiff.
				6,8			110.7	10.2	
5				5,10		ML	95.4	31.0	Dark Yellow Brown Clayey Silt with Fine Sand, Saturated, Stiff.
				21,50 for 5"		CL	100.9	20.0	Pale Yellow Brown Fine to Medium Sandy Clay with Silt, Wet, Hard.
10				14,19		SM	106.5	7.2	Pale Yellow Brown Silty Fine to Medium Sand, Moist, Medium Dense.
15									<p>Total Depth = 11'</p> <p>No Bedrock encountered during drilling.</p> <p>No free groundwater encountered during drilling.</p> <p>Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.</p>



**Boring No: 25**  
**Project Name: Avenue K Transmission Line**  
**Project Number: PL-05531-01**  
**Boring Location: Per Plan**

**Drilling Date: January 10, 2001**  
**Drilling Method: Hollow Stem**  
**Drill Type: CME 55**  
**Logged By: Rob Ferguson**

Depth (Ft.)	Sample Type		Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT						
0					SM			Moderate Yellow Brown Silty Fine to Medium Sand with Clay, Moist to Wet, Medium Dense.
			6,30			101.0	13.0	
5			31,23		ML	111.5	14.1	Moderate Yellow Brown Fine Sandy Silt with Clay, Moist to Wet, Hard.
			15,23		SM	115.9	8.7	Moderate Yellow Brown Silty Fine to Coarse Sand, Moist, Medium Dense.
10			12,15		ML	97.6	13.3	Moderate Yellow Brown Fine Sandy Silt, Moist to Wet, Very Stiff.
15								Total Depth = 11'
								No Bedrock encountered during drilling.
								No free groundwater encountered during drilling.
								Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.



Boring No: 26  
Project Name: Avenue K Transmission Line  
Project Number: PL-05531-01  
Boring Location: Per Plan

Drilling Date: January 8, 2001  
Drilling Method: Hollow Stem  
Drill Type: CME 55  
Logged By: Rob Ferguson

Depth (Ft.)	Sample Type			Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pct)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT	MOD Calif.						
0									
				4,23		SC	106.0	18.1	Pale Yellow Brown Clayey Fine to Coarse Sand with Silt, Moist to Wet, Medium Dense.
5				6,7		CL	93.3	15.4	Pale Yellow Brown Silty Clay, Moist to Wet, Stiff.
				11,22		CL	106.8	16.3	Pale Yellow Brown Fine to Medium Sandy Clay with Silt, Moist to Wet, Very Stiff.
10				13,11		SM	112.2	13.1	Dark Yellow Brown Clayey Fine to Medium Sand with Silt, Moist to Wet, Medium Dense.
15									<p>Total Depth = 11'</p> <p>No Bedrock encountered during drilling.</p> <p>No free groundwater encountered during drilling.</p> <p>Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.</p>



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**Boring No:** 27  
**Project Name:** Avenue K Transmission Line  
**Project Number:** PL-05531-01  
**Boring Location:** Per Plan

Drilling Date: January 8, 2001  
Drilling Method: Hollow Stem  
Drill Type: CME 55  
Logged By: Rob Ferguson

Depth (Ft.)	Sample Type		Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pct)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT						
0					CL			<p>Very Pale Orange Silty Clay, Moist, Hard.</p> <p>Moderate Yellow Brown Silty Fine to Medium Sand, Moist, Medium Dense.</p> <p>Pale Yellow Brown Silty Fine to Coarse Sand with Clay, Moist, Dense.</p> <p>Dark Yellow Brown Silty Clay with Fine Sand, Moist to Wet, Very Stiff.</p>
			50 for 5"			90.0	12.7	
5			12,22		SM	113.9	5.5	
			21,30		SM	111.6	5.6	
10			10,11		CL	107.4	17.2	<p>Total Depth = 11'</p> <p>No Bedrock encountered during drilling.</p> <p>No free groundwater encountered during drilling.</p> <p>Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.</p>
15								



Boring No: 28  
Project Name: Avenue K Transmission Line  
Project Number: PL-05531-01  
Boring Location: Per Plan

Drilling Date: January 9, 2001  
Drilling Method: Hollow Stem  
Drill Type: CME 55  
Logged By: Tim Thomson

Depth (Ft.)	Sample Type			Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT	MOD Calif.						
0									
				50 for 5"		CL	90.2	18.4	Pale Yellow Brown Fine Sandy Clay with Silt and Calcium Carbonate Throughout Matrix, Moist to Wet, Hard.
5				20,21		CL	88.2	27.6	Pale Yellow Brown Silty Clay with Fine Sand and Calcium Carbonate, Wet, Hard.
				20,30		SM	108.2	10.8	Dark Yellow Brown Silty Fine Sand with Slight Clay, Moist, Dense.
10				23,33		SM	123.1	7.0	Moderate Yellow Brown Silty Fine to Coarse Sand, Moist, Dense.
15									Total Depth = 11'
									No Bedrock encountered during drilling.
									No free groundwater encountered during drilling.
									Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.



<b>Boring No:</b> 29	<b>Drilling Date:</b> January 9, 2001
<b>Project Name:</b> Avenue K Transmission Line	<b>Drilling Method:</b> Hollow Stem
<b>Project Number:</b> PL-05531-01	<b>Drill Type:</b> CME 55
<b>Boring Location:</b> Per Plan	<b>Logged By:</b> Tim Thomson

Depth (Ft.)	Sample Type			Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT	MOD Calif.						
0						SC			Pale Yellow Brown Clayey Fine to Coarse Sand with Silt and Calcium Carbonate Throughout Matrix, Moist to Wet, Dense.
				9,40			83.0	23.0	
5				17,30		CL	111.6	20.0	Moderate Olive Brown Fine Sandy Clay with Silt and Calcium Carbonate throughout Matrix, Moist to Wet, Hard.
				14,25		CL	106.8	21.5	Moderate Yellow Brown Fine Sandy Clay with Silt and Calcium Carbonate Stringers Throughout, Moist to Wet, Hard.
10				9,19		CL	100.0	24.5	Mottled Moderate Yellow Brown/Pale Yellow Brown Fine Sandy Clay with Silt, Saturated, Hard.
15									<p>Total Depth = 11'</p> <p>No Bedrock encountered during drilling.</p> <p>No free groundwater encountered during drilling.</p> <p>Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.</p>





Boring No: 30  
Project Name: Avenue K Transmission Line  
Project Number: PL-05531-01  
Boring Location: Per Plan

Drilling Date: January 9, 2001  
Drilling Method: Hollow Stem  
Drill Type: CME 55  
Logged By: Tim Thomson

Depth (Ft.)	Sample Type		Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT						
0			17,13		SC	94.4	18.2	Pale Yellow Brown Fine to Coarse Sandy Clay with Silt and Calcium Carbonate Throughout Matrix, Moist, Medium Dense.
5					CL			Moderate Yellow Brown Silty Fine to Medium Sand with Slight Clay, Moist to Wet, Hard.
					CL			Moderate Yellow Brown Fine Sandy Clay with Silt, Moist to Wet, Very Stiff.
					CL			Moderate Yellow Brown Silty Fine Sand, Moist, Very Stiff.
10			18,14			121.0	5.2	
15								
Total Depth = 11'								
No Bedrock encountered during drilling.								
No free groundwater encountered during drilling.								
Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.								



**Boring No: 31**  
**Project Name: Avenue K Transmission Line**  
**Project Number: PL-05531-01**  
**Boring Location: Per Plan**

**Drilling Date: January 9, 2001**  
**Drilling Method: Hollow Stem**  
**Drill Type: CME 55**  
**Logged By: Tim Thomson**

Depth (Ft.)	Sample Type			Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT	MOD Calif.						
0						SC			Pale Yellow Brown Clayey Fine to Coarse Sand with Silt and Calcium Carbonate Throughout Matrix, Moist, Medium Dense.
				17,26			88.0	17.4	
						SM			Moderate Yellow Brown Silty Fine to Medium Sand with Clay, Moist to Wet, Medium Dense.
5				14,21			106.6	10.0	
						SM			Moderate Yellow Brown Silty Fine to Medium Sand, Moist, Medium Dense.
				17,21			114.1	6.4	
						SM			Moderate Yellow Brown Silty Fine to Coarse Sand, Slightly Moist, Dense.
10				29,41			117.5	3.2	
									Total Depth = 11'
									No Bedrock encountered during drilling.
									No free groundwater encountered during drilling.
15									Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.



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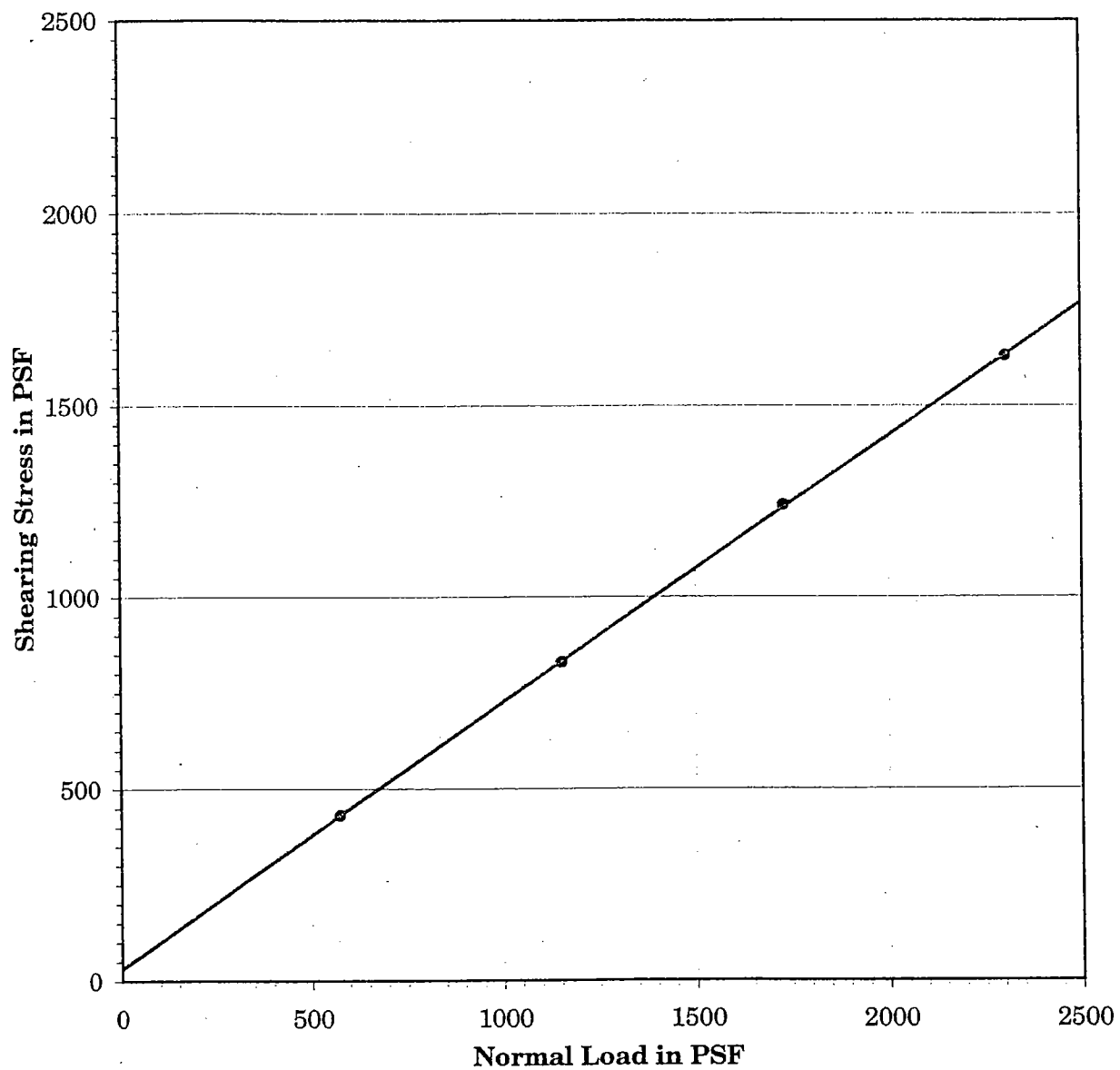
**Boring No:** 32  
**Project Name:** Avenue K Transmission Line  
**Project Number:** PL-05531-01  
**Boring Location:** Per Plan

Drilling Date: January 9, 2001  
Drilling Method: Hollow Stem  
Drill Type: CME 55  
Logged By: Tim Thomson

Depth (Ft.)	Sample Type			Penetration Resistance (Blows/6")	Symbol	USCS	Dry Density (pcf)	Moisture Content (%)	DESCRIPTION OF UNITS
	Bulk	SPT	MOD Calif.						
0									
						CL			Pale Yellow Brown Fine Sandy Clay with Silt and Calcium Carbonate Throughout Matrix, Moist, Hard.
				44,43			97.0	16.3	
						SM			Moderate Yellow Brown Silty Fine to Medium Sand with Clay, Moist, Medium Dense.
5				12,15			110.4	10.9	
						SM			Moderate Yellow Brown Silty Fine to Coarse Sand, Moist, Dense.
				20,34			125.9	7.5	
						ML			Moderate Yellow Brown Fine Sandy Silt, Moist, Hard.
10				20,24			109.6	13.6	
									Total Depth = 11'
									No Bedrock encountered during drilling.
									No free groundwater encountered during drilling.
15									Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradational.

**APPENDIX B**

Summary of Laboratory Test Results



#### DIRECT SHEAR DATA\*

Sample Location: Boring 7@0-5', Remolded  
 Material: Dark Yellow Brown Silty Fine Sand (SM)  
 Dry Density (pcf): 104.9  
 $\phi$  Angle of Friction (degrees): 35  
 c Cohesive Strength (psf): 30  
 Test Type: Peak

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

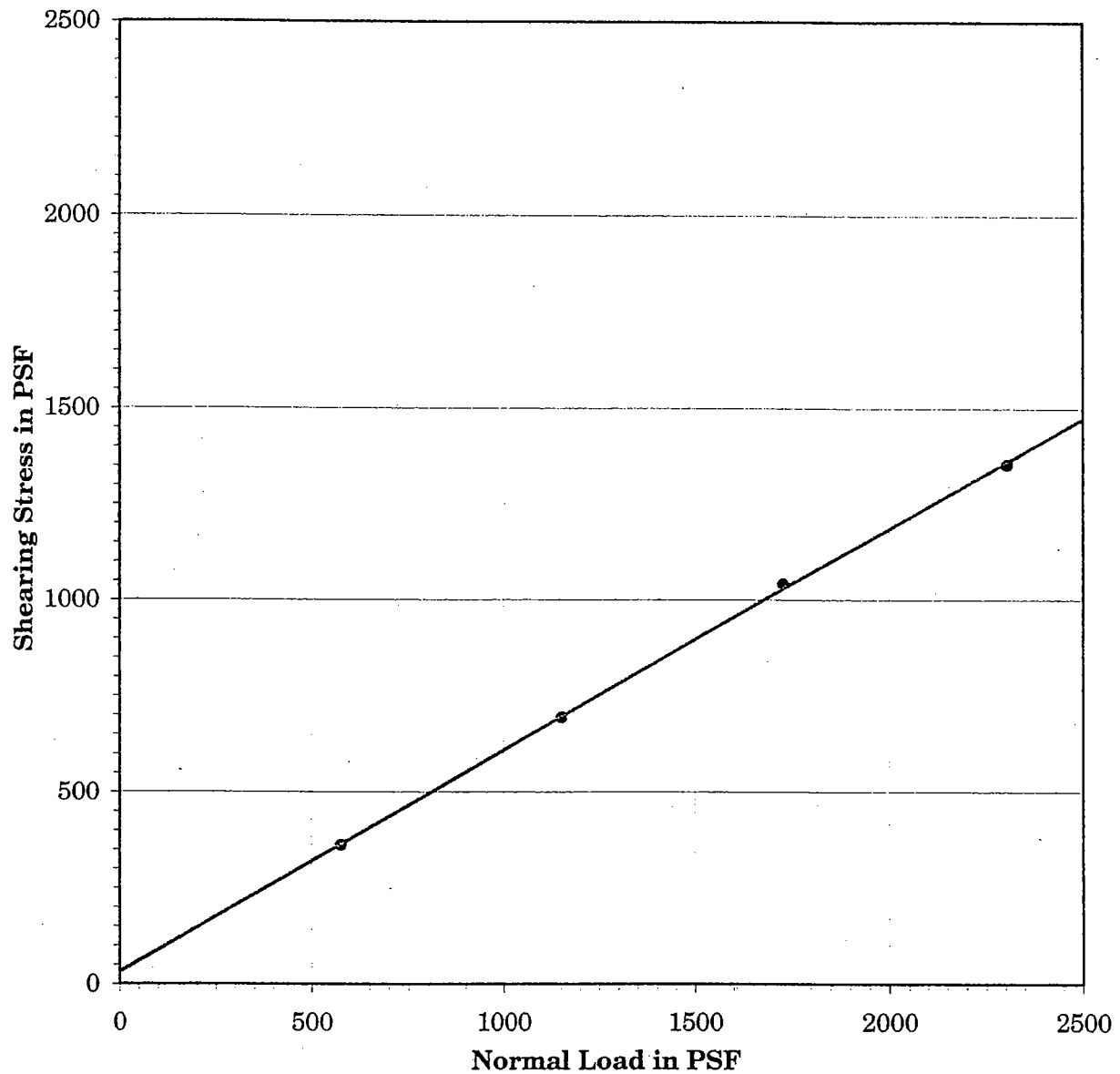
**Avenue K Transmission Line  
 Lancaster, California**



**Earth Systems  
 Southern California**

2/9/01

PL-05531-01



#### DIRECT SHEAR DATA\*

Sample Location: Boring 23@0-5', Remolded

Material: Dark Yellow Brown Silty Fine to Coarse Sand (SM)

Dry Density (pcf): 116.1

$\phi$  Angle of Friction (degrees): 30

c Cohesive Strength (psf): 30

Test Type: Peak

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

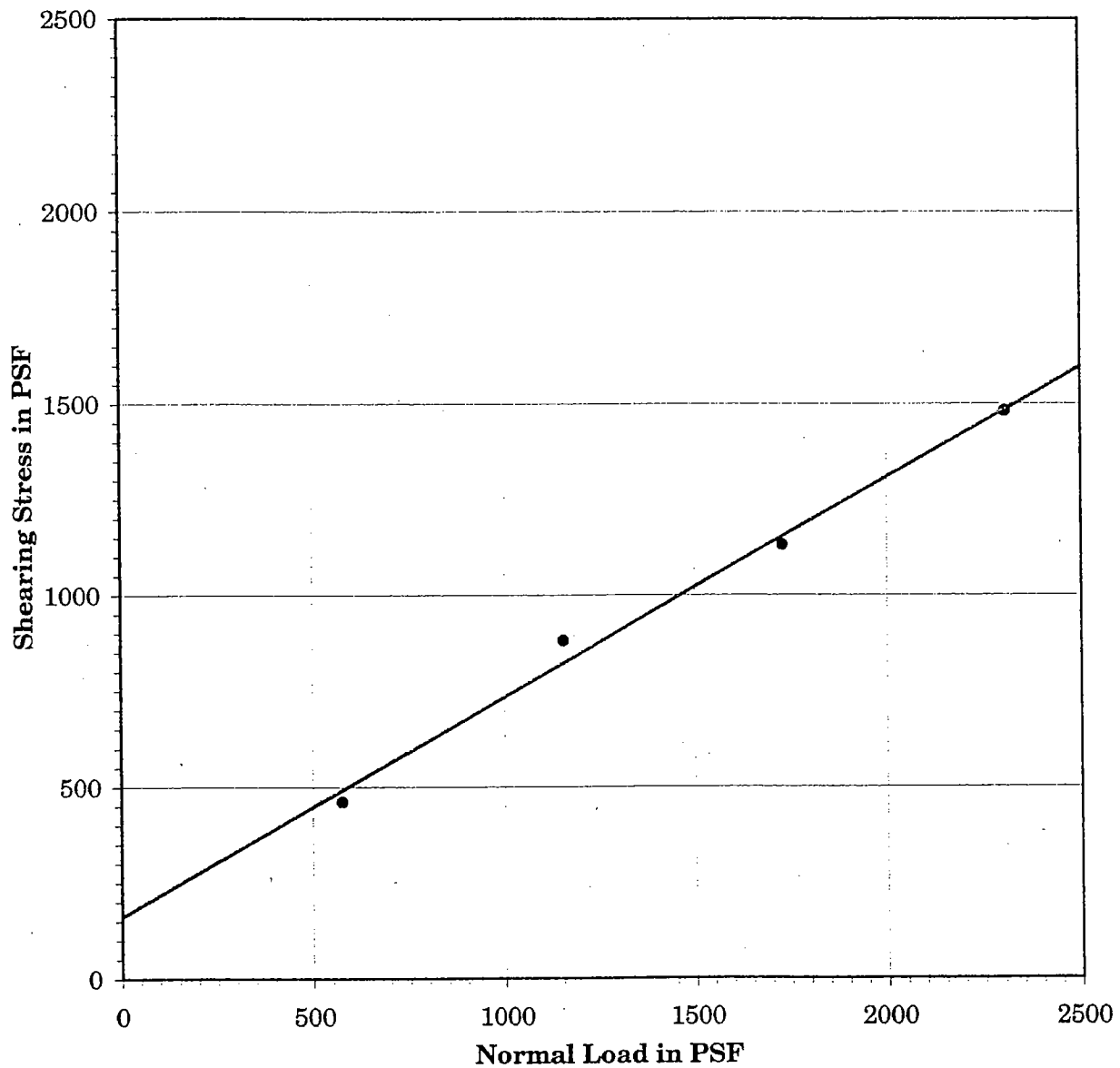
**Avenue K Transmission Line  
Lancaster, California**



**Earth Systems  
Southern California**

2/9/01

PL-05531-01



#### DIRECT SHEAR DATA\*

Sample Location: Boring 28@0-5', Remolded

Material: Pale Yellow Brown Fine Sandy Clay (CL)

Dry Density (pcf): 97.7

$\phi$  Angle of Friction (degrees): 30

c Cohesive Strength (psf): 160

Test Type: Peak

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

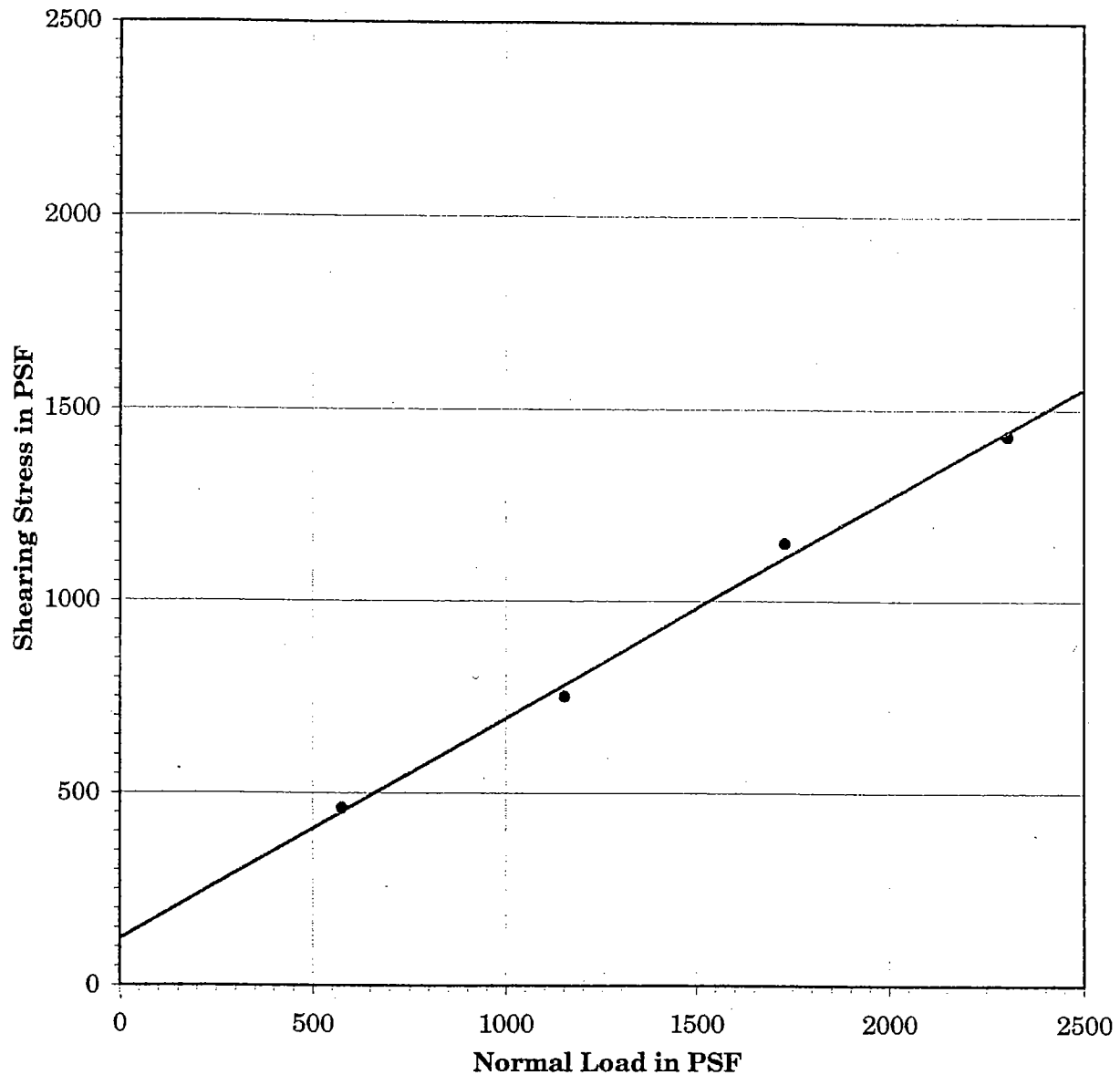
Avenue K Transmission Line  
Lancaster, California



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**Southern California**

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#### DIRECT SHEAR DATA\*

Sample Location: Boring 2@2', in-situ

Material: Moderate Yellow Brown Very Silty Fine to Medium Sand (SM)

Dry Density (pcf): 110.9

$\phi$  Angle of Friction (degrees): 30

c Cohesive Strength (psf): 120

Test Type: Peak

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

**Avenue K Transmission Line  
Lancaster, California**

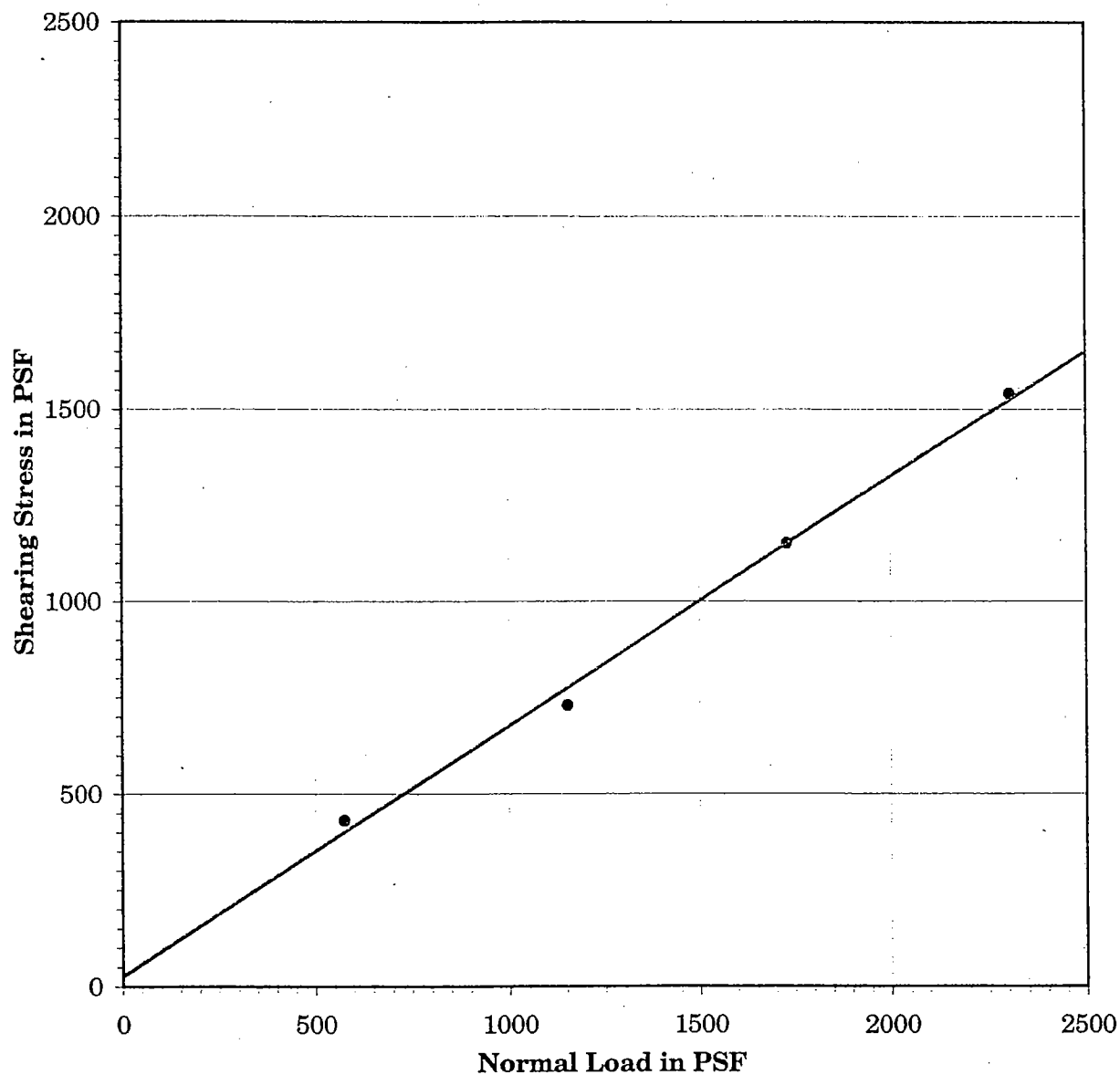


**Earth Systems  
Southern California**

2/9/01

PL-05531-01





#### DIRECT SHEAR DATA\*

Sample Location: Boring 4@2', in-situ

Material: Dark Yellow Brown Silty Fine to Coarse Sand (SM)

Dry Density (pcf): 117.2

$\phi$  Angle of Friction (degrees): 33

c Cohesive Strength (psf): 30

Test Type: Peak

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

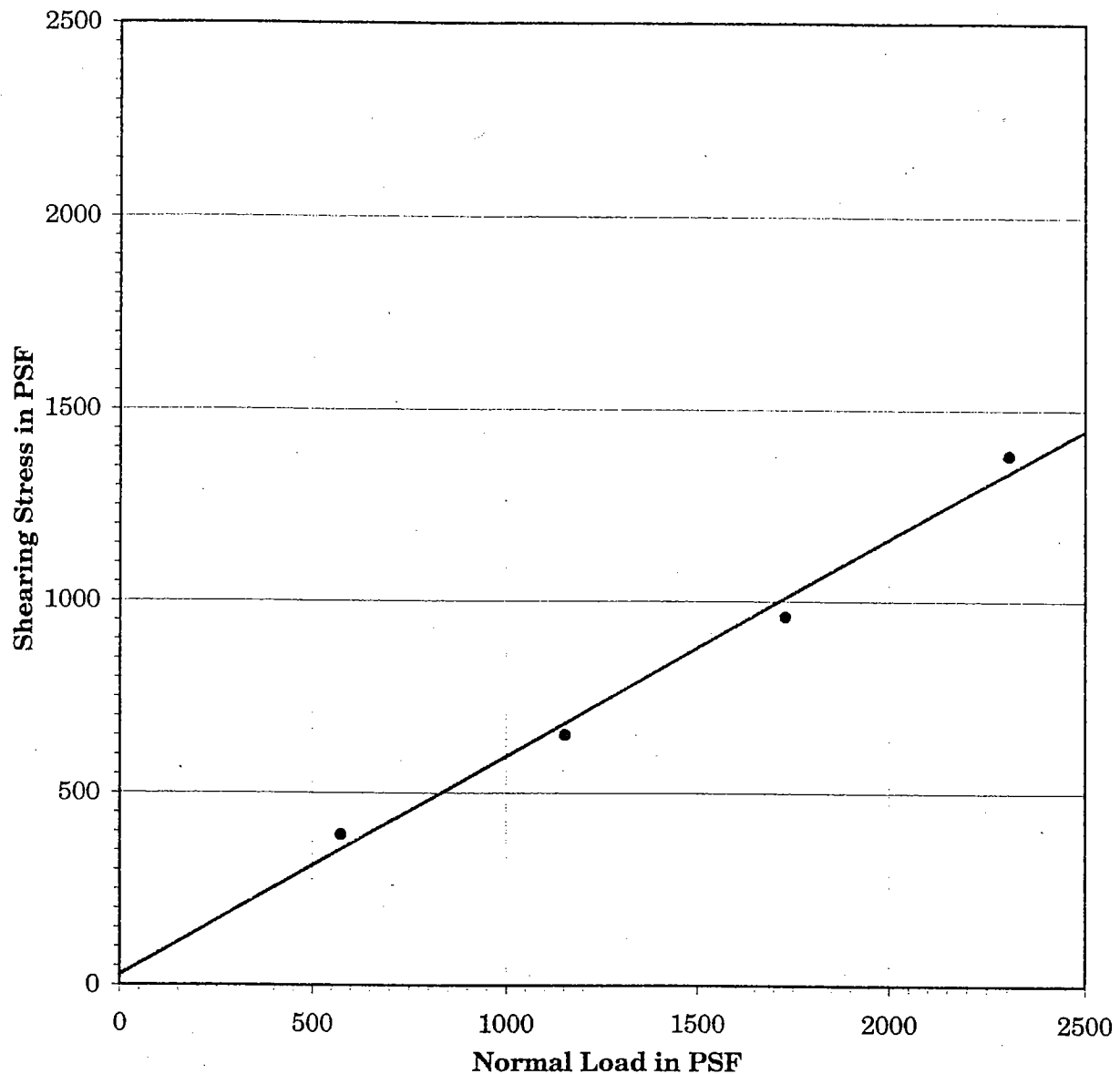
**Avenue K Transmission Line  
Lancaster, California**



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#### DIRECT SHEAR DATA\*

Sample Location: Boring 6@2', in-situ

Material: Dark Yellow Brown Fine Sandy Silt (ML)

Dry Density (pcf): 97.4

$\phi$  Angle of Friction (degrees): 30

c Cohesive Strength (psf): 30

Test Type: Peak

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

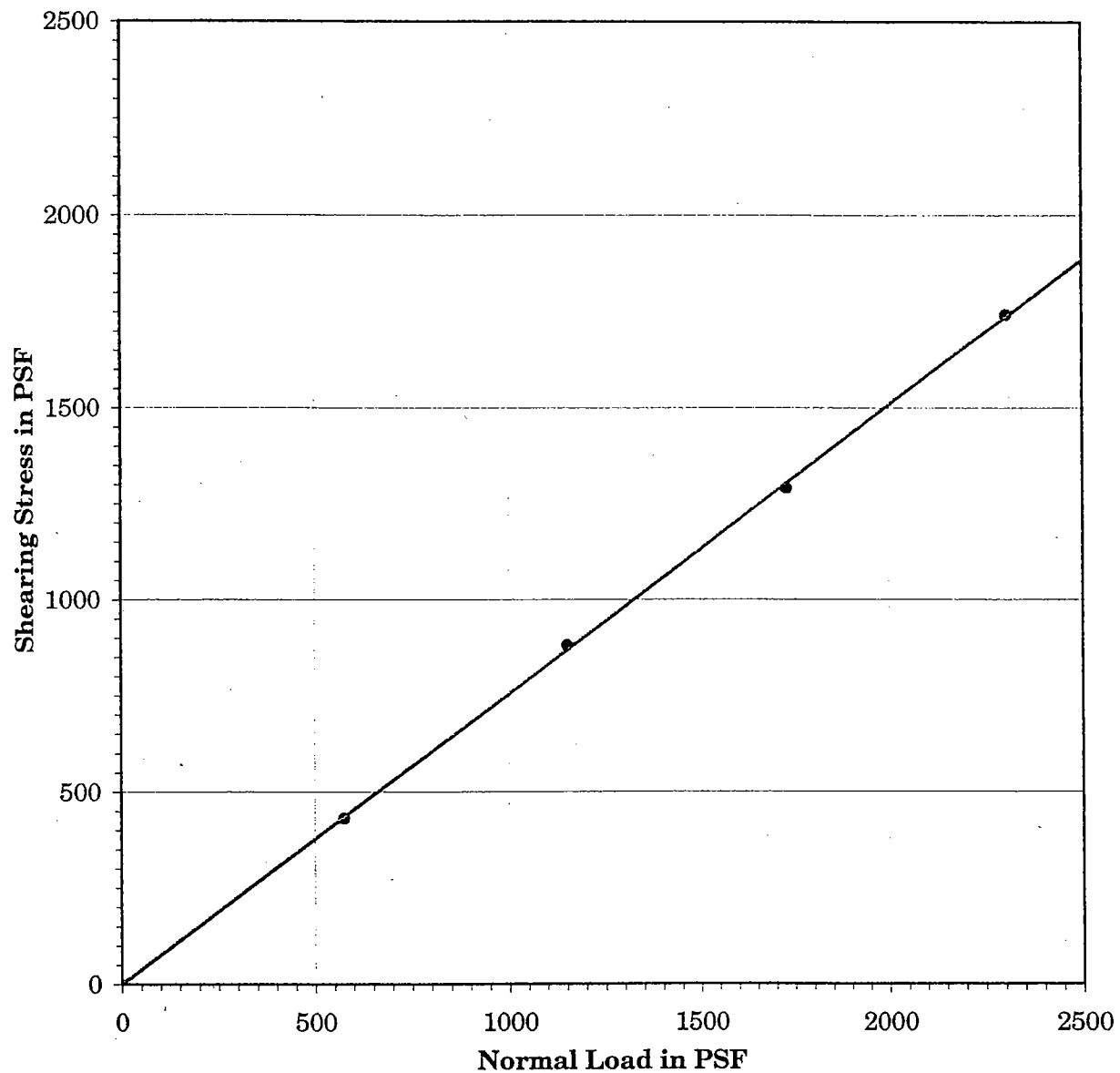
**Avenue K Transmission Line  
Lancaster, California**



**Earth Systems  
Southern California**

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PL-05531-01



#### DIRECT SHEAR DATA\*

Sample Location: Boring 8@5', in-situ

Material: Dark Yellow Brown Silty Fine to Medium Sand (SM)

Dry Density (pcf): 113

$\phi$  Angle of Friction (degrees): 37

c Cohesive Strength (psf): 0

Test Type: Peak

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

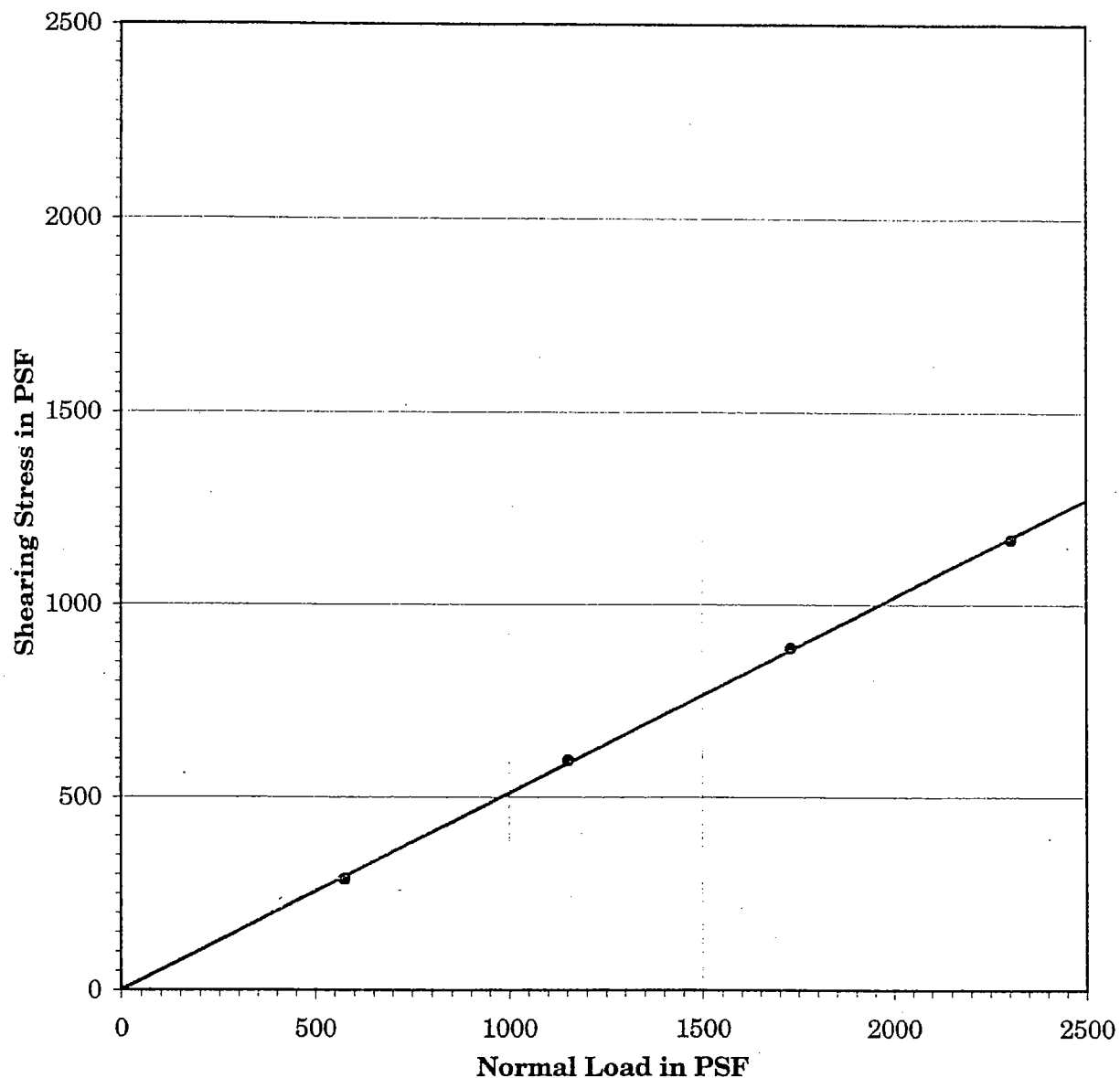
Avenue K Transmission Line  
Lancaster, California



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**Southern California**

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### DIRECT SHEAR DATA\*

Sample Location: Boring 10@5', in-situ

Material: Dark Yellow Brown Fine Sandy Silt (ML)

Dry Density (pcf): 117.9

$\phi$  Angle of Friction (degrees): 27

c Cohesive Strength (psf): 0

Test Type: Peak

\* Test Method: ASTM D-3080

### DIRECT SHEAR TEST

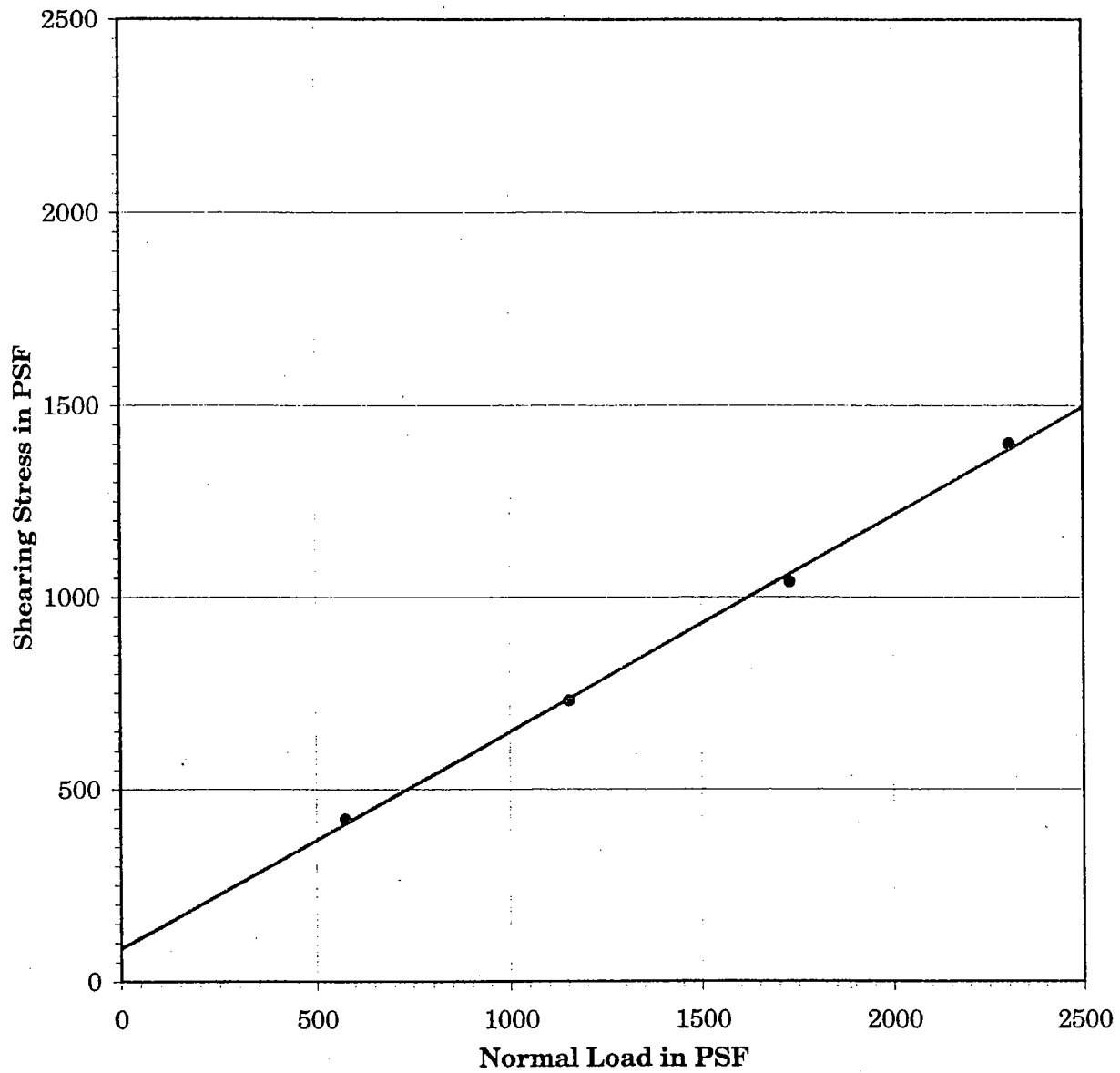
**Avenue K Transmission Line  
Lancaster, California**



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Southern California**

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#### DIRECT SHEAR DATA\*

Sample Location: Boring 12@5', in-situ.

Material: Dark Yellow Brown Fine Sandy Silt with Clay (ML)

Dry Density (pcf): 99.3

$\phi$  Angle of Friction (degrees): 29

c Cohesive Strength (psf): 90

Test Type: Peak

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

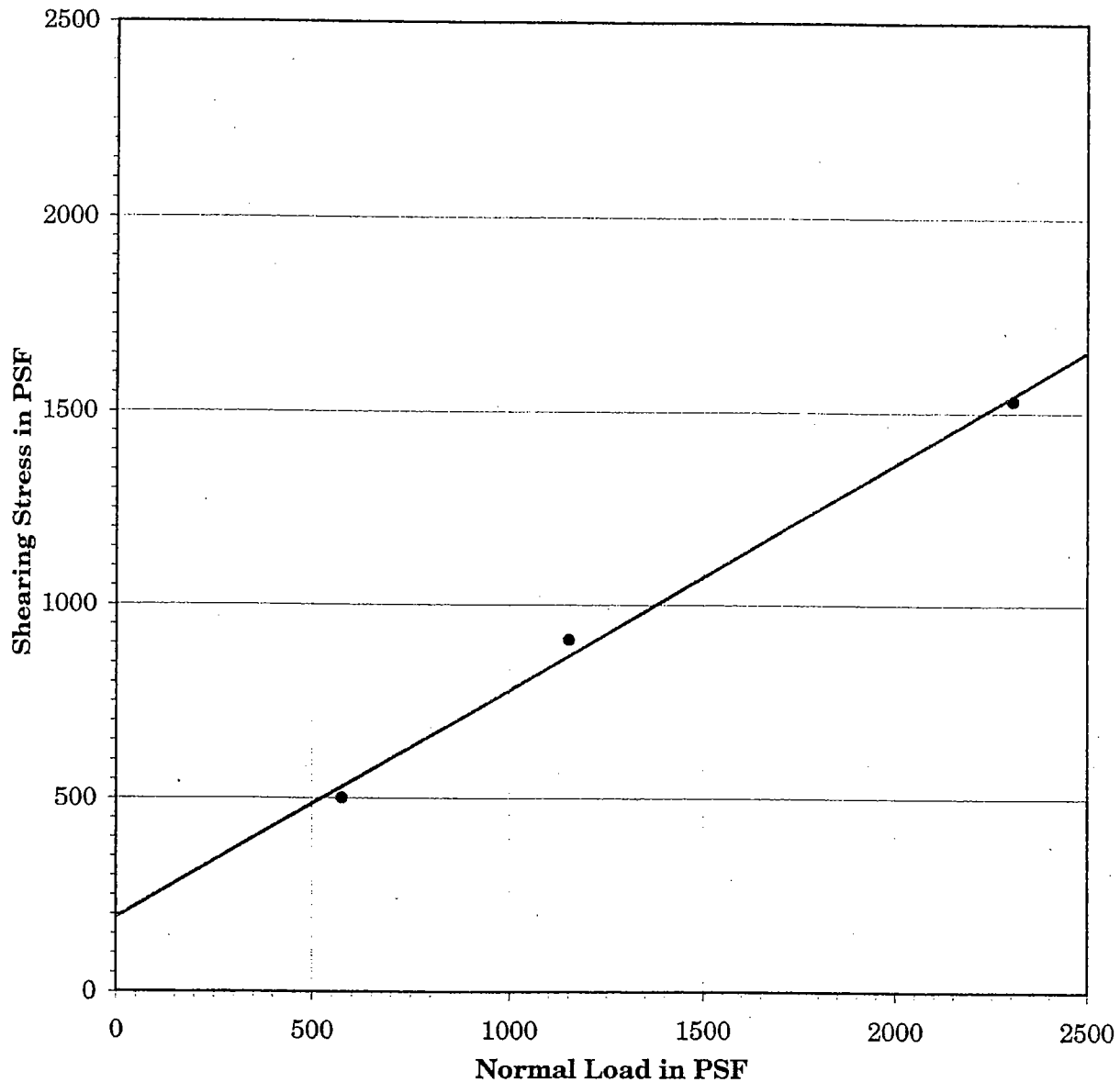
Avenue K Transmission Line  
Lancaster, California



**Earth Systems**  
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### DIRECT SHEAR DATA\*

Sample Location: Boring 14@5', in-situ.

Material: Dark Yellow Brown Silty Fine to Medium Sand (SM)

Dry Density (pcf): 111

$\phi$  Angle of Friction (degrees): 30

c Cohesive Strength (psf): 190

Test Type: Peak

\* Test Method: ASTM D-3080

### DIRECT SHEAR TEST

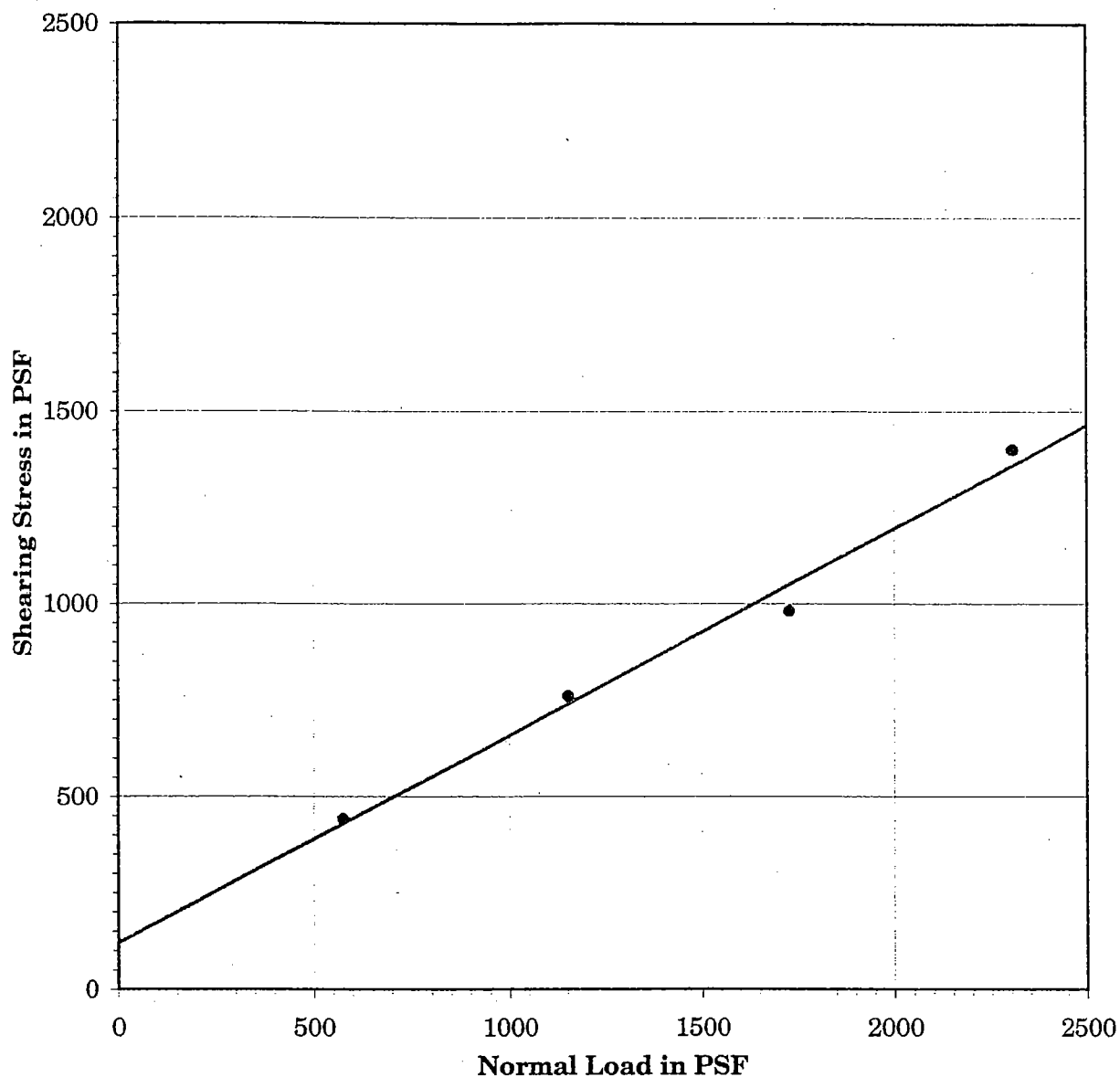
Avenue K Transmission Line  
Lancaster, California



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**Southern California**

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#### DIRECT SHEAR DATA\*

Sample Location: Boring 16@5', in-situ.

Material: Moderate Brown Clayey Silt with Fine Sand (ML)

Dry Density (pcf): 90.5

$\phi$  Angle of Friction (degrees): 28

c Cohesive Strength (psf): 120

Test Type: Peak

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

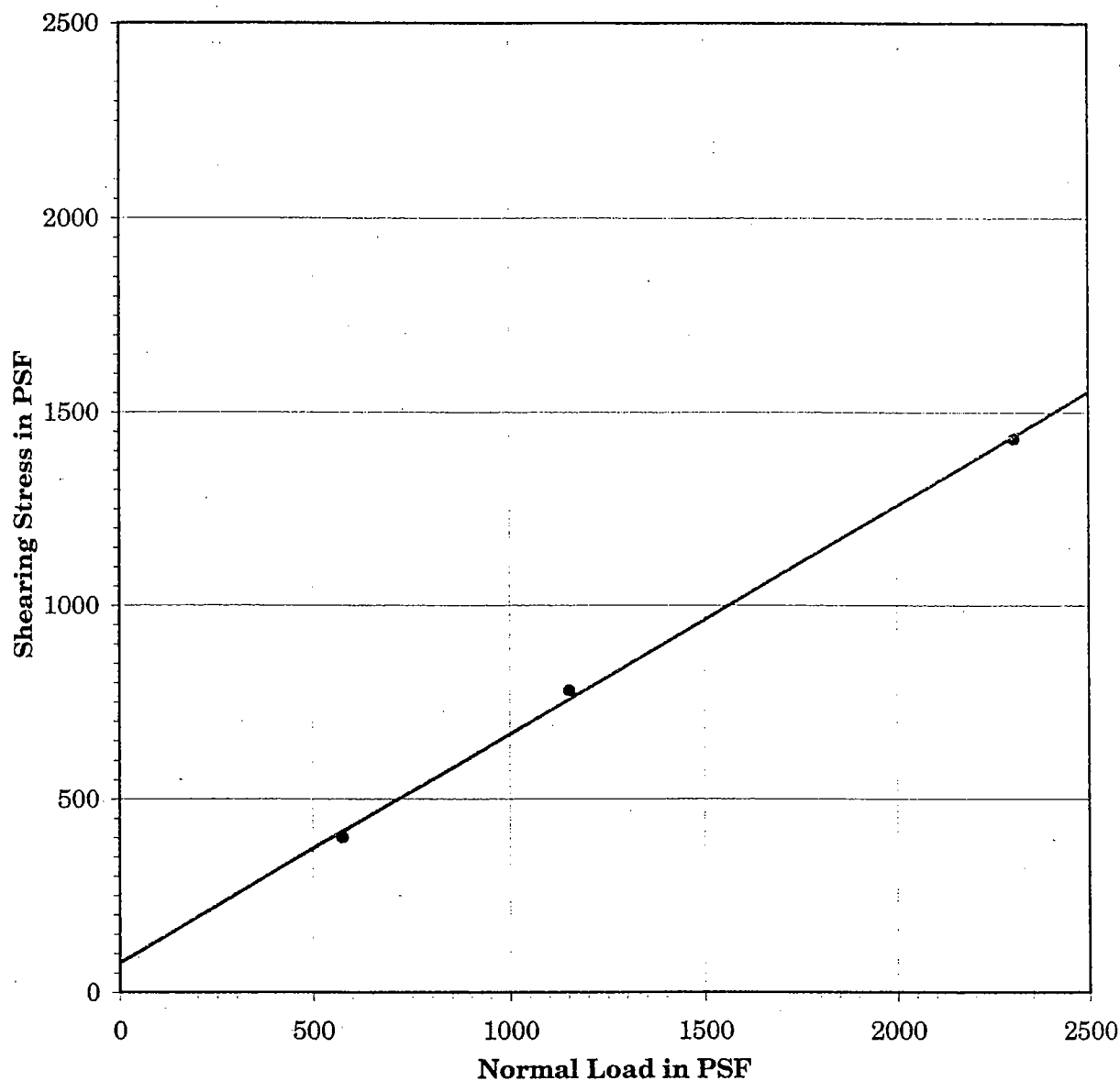
**Avenue K Transmission Line  
Lancaster, California**



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Southern California**

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#### DIRECT SHEAR DATA\*

Sample Location: Boring 20@2', in-situ.

Material: Dark Yellow Brown Fine Sandy Silt with Clay (ML)

Dry Density (pcf): 100.8

$\phi$  Angle of Friction (degrees): 31

c Cohesive Strength (psf): 70

Test Type: Peak

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

Avenue K Transmission Line  
Lancaster, California

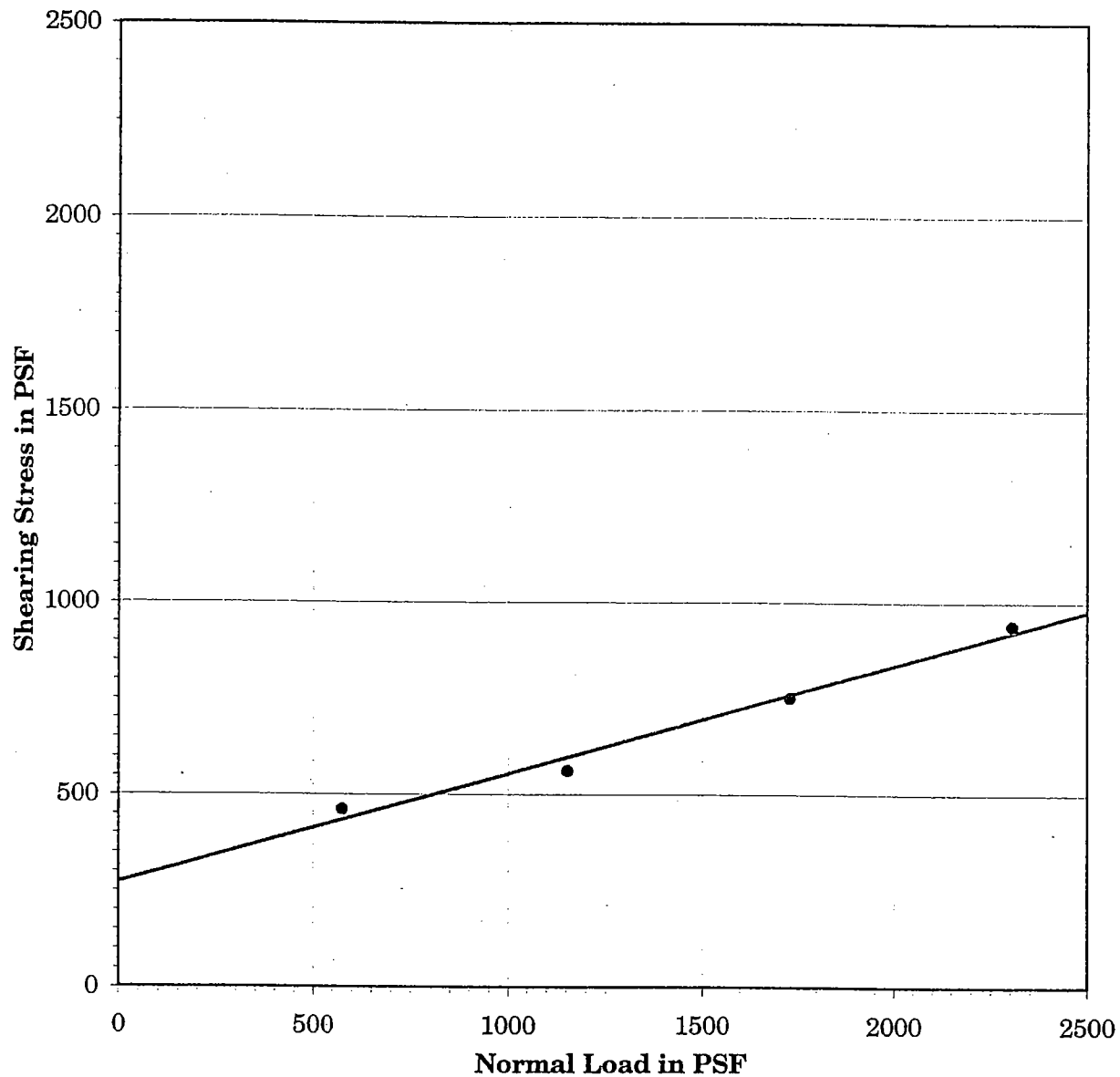


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#### DIRECT SHEAR DATA\*

Sample Location: Boring 22@2', in-situ.

Material: Dark Yellow Brown Clayey Silt (ML)

Dry Density (pcf): 97.3

$\phi$  Angle of Friction (degrees): 16

c Cohesive Strength (psf): 270

Test Type: Peak

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

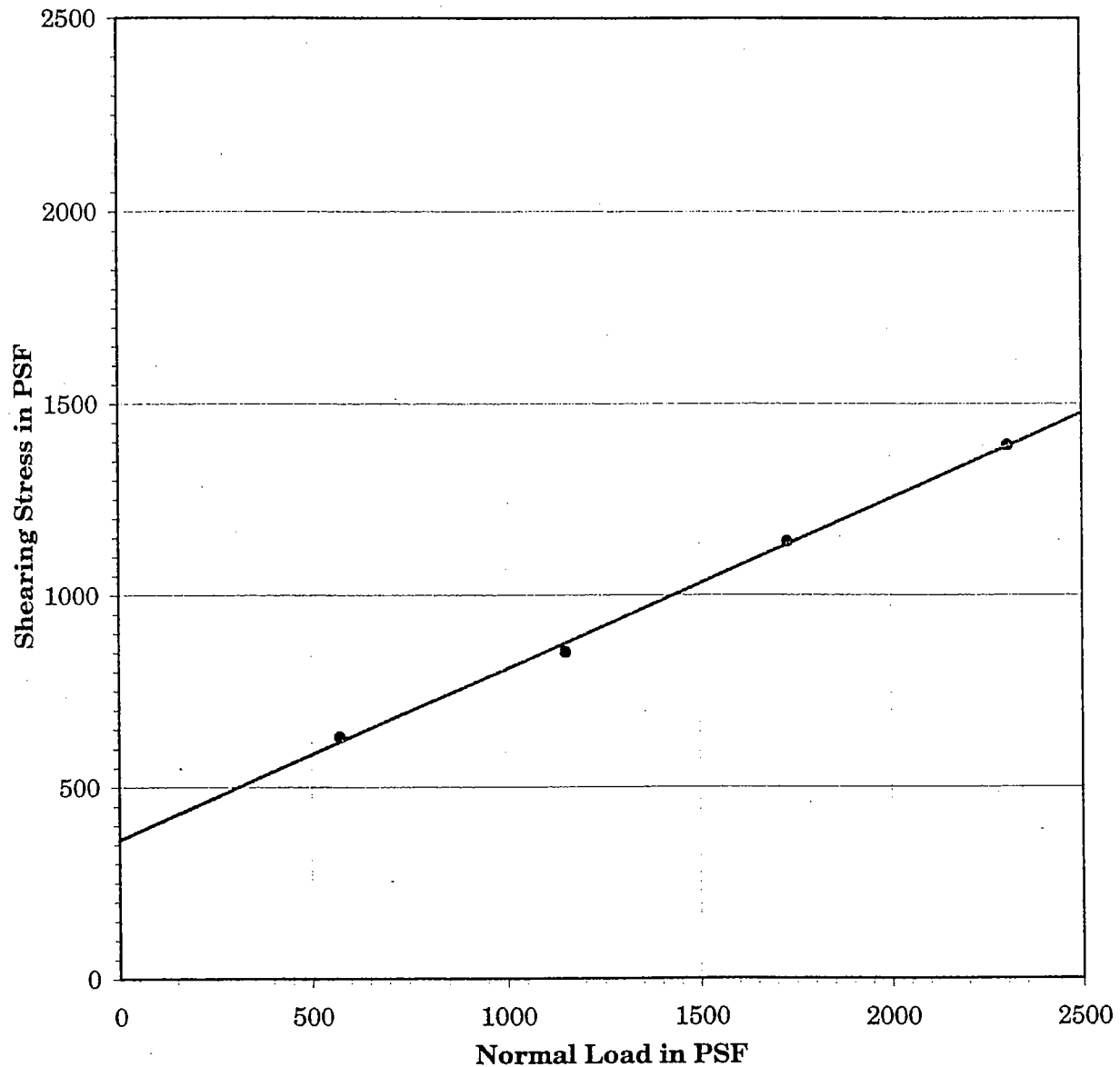
**Avenue K Transmission Line  
Lancaster, California**



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Southern California**

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#### DIRECT SHEAR DATA\*

Sample Location: Boring 24@5', in-situ.

Material: Dark Yellow Brown Clayey Silt with Fine Sand (ML)

Dry Density (pcf): 95.4

$\phi$  Angle of Friction (degrees): 24

c Cohesive Strength (psf): 360

Test Type: Peak

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

**Avenue K Transmission Line  
Lancaster, California**

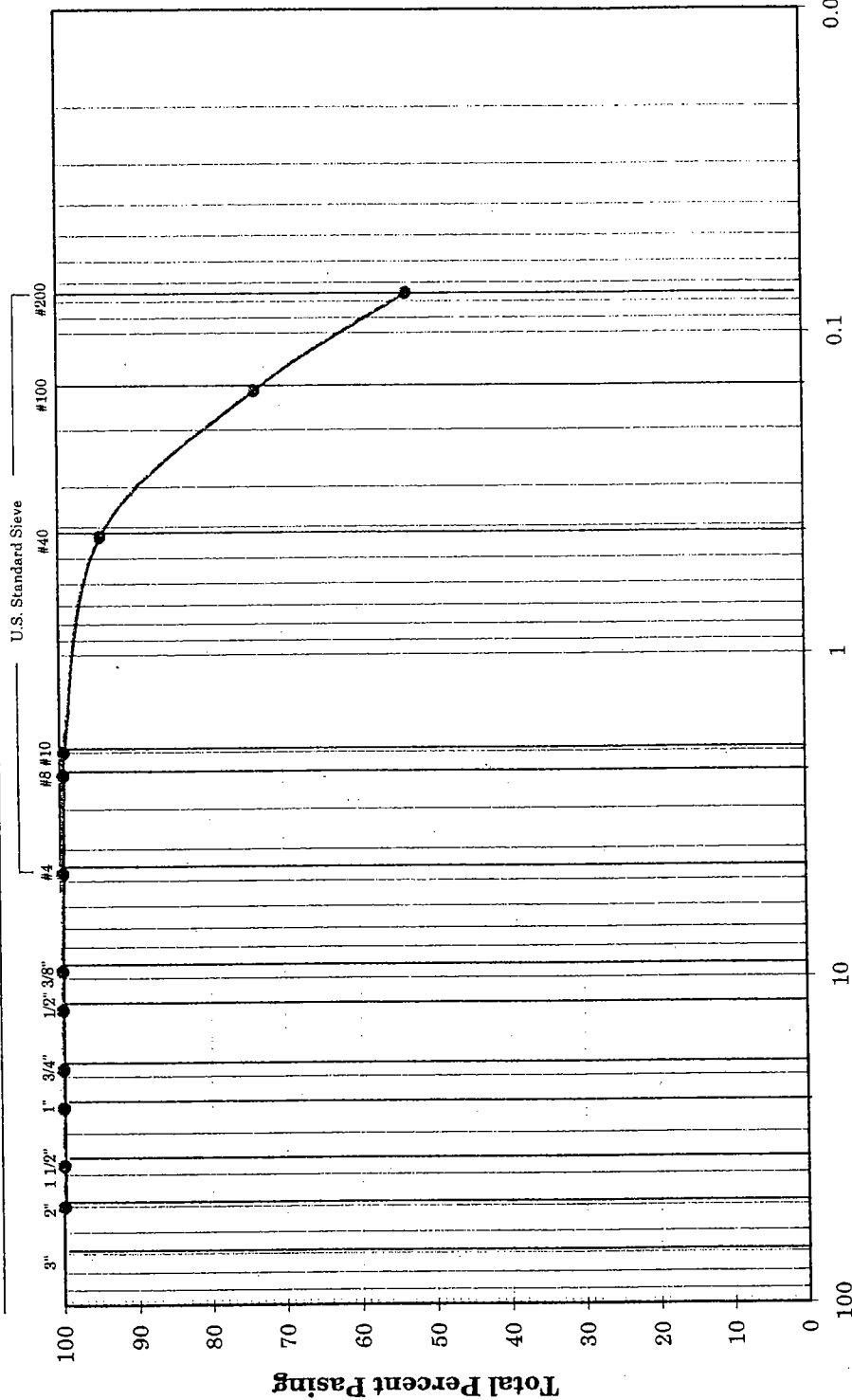


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Gravel			Coarse Sand	Medium Sand	Fine Sand	Silt or Clay
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Grain Diameter (millimeters)

## SIEVE ANALYSIS

Avenue K Transmission Line  
Lancaster, California



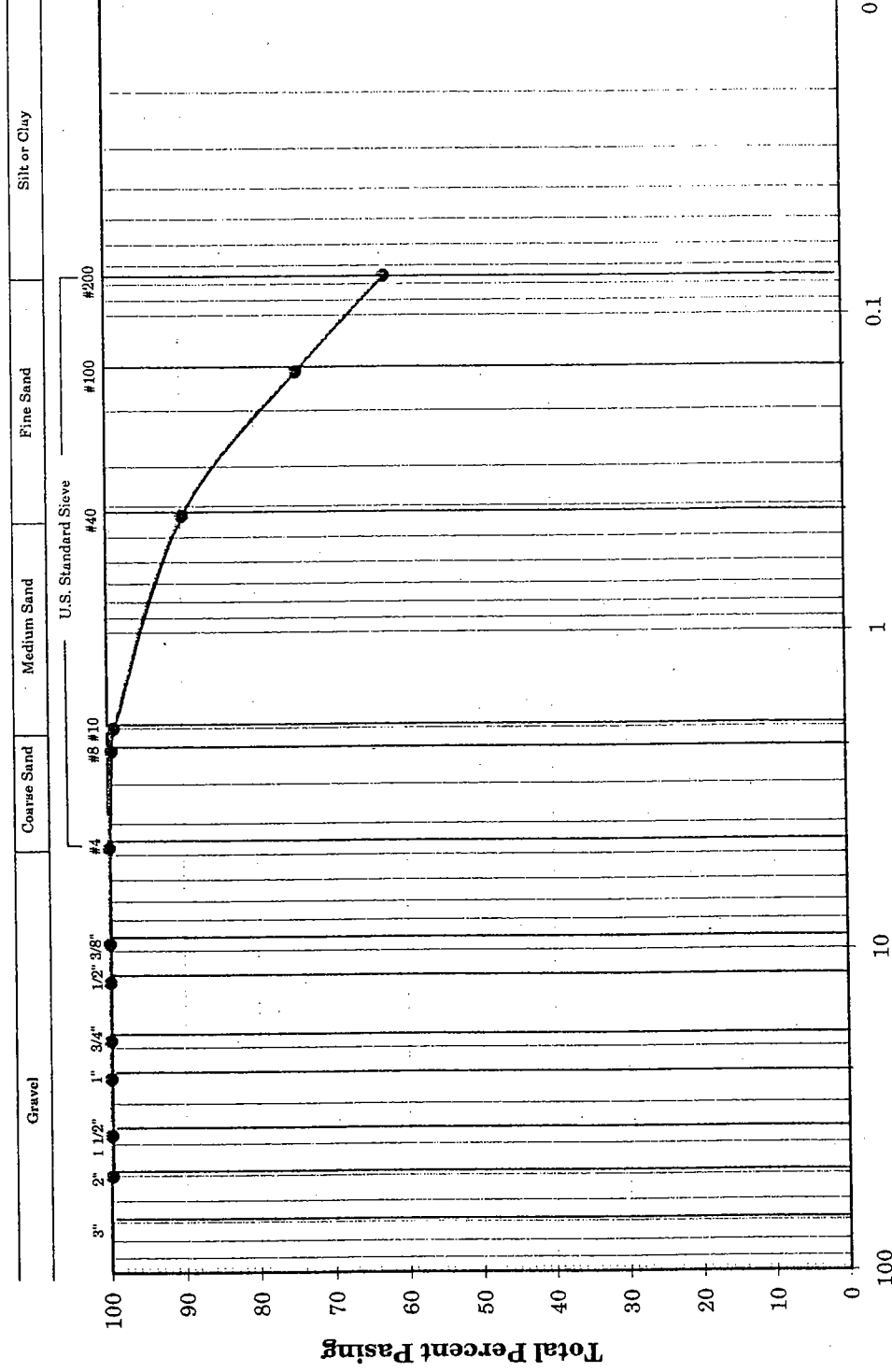
**Earth Systems**  
**Southern California**

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PL-05531-01

Sample Location: Boring 22@7.5'

Sample Description: Fine Sandy Silt (ML)



**Grain Diameter (millimeters)**

**SIEVE ANALYSIS**

Avenue K Transmission Line  
Lancaster, California

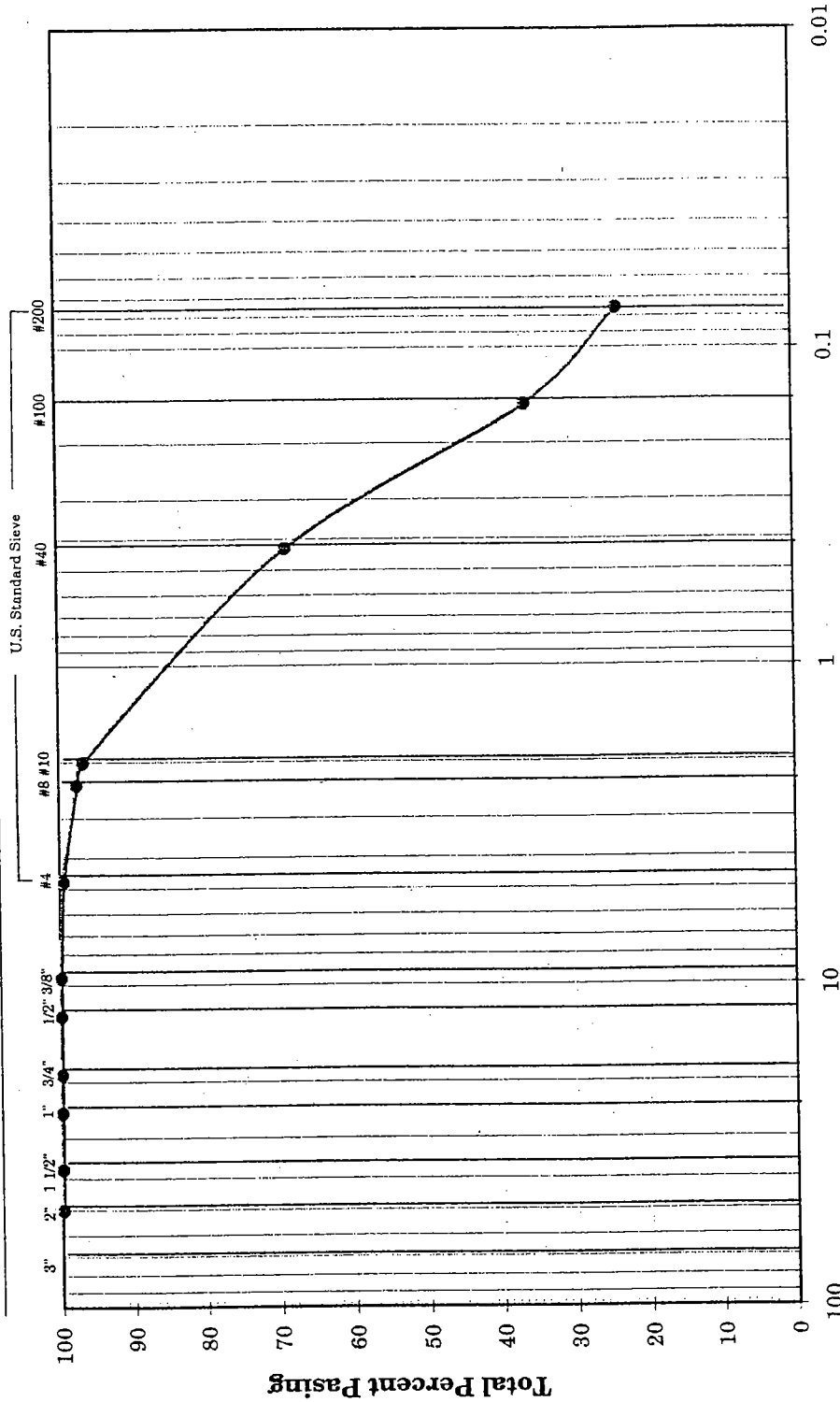
**Earth Systems**  
**Southern California**

2/9/01      PL-05531-01

Sample Location: Boring 24@7.5'

Sample Description: Fine to Medium Sandy Clay with Silt (CL)

Gravel		Coarse Sand	Medium Sand	Fine Sand	Silt or Clay
		U.S. Standard Sieve			



Grain Diameter (millimeters)

## SIEVE ANALYSIS

Avenue K Transmission Line

Lancaster, California



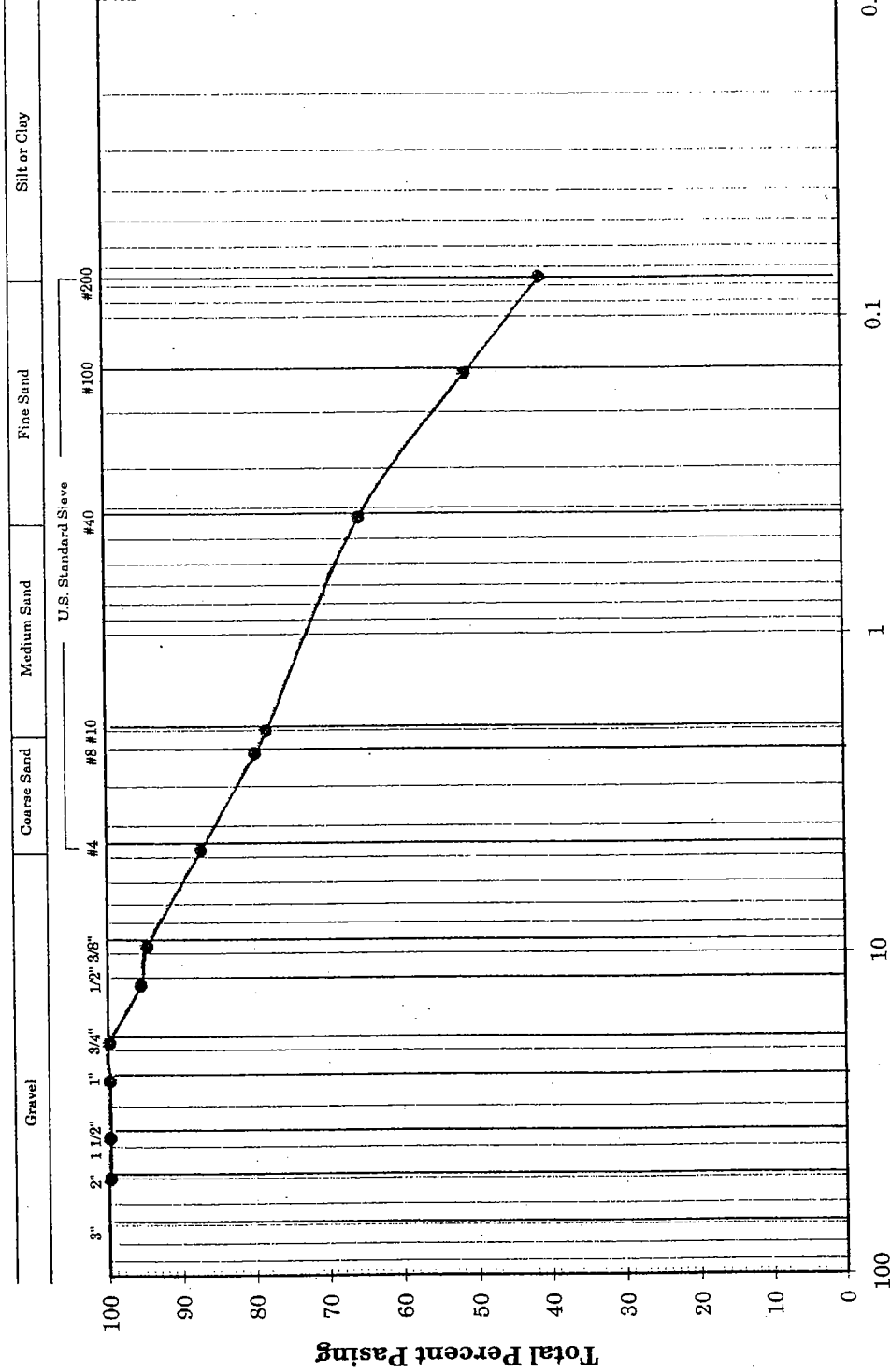
**Earth Systems**  
**Southern California**

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PL-05531-01

Sample Location: Boring 25@2'

Sample Description: Silty Fine to Medium Sand (SM)



Grain Diameter (millimeters)

SIEVE ANALYSIS

Avenue K Transmission Line  
Lancaster, California

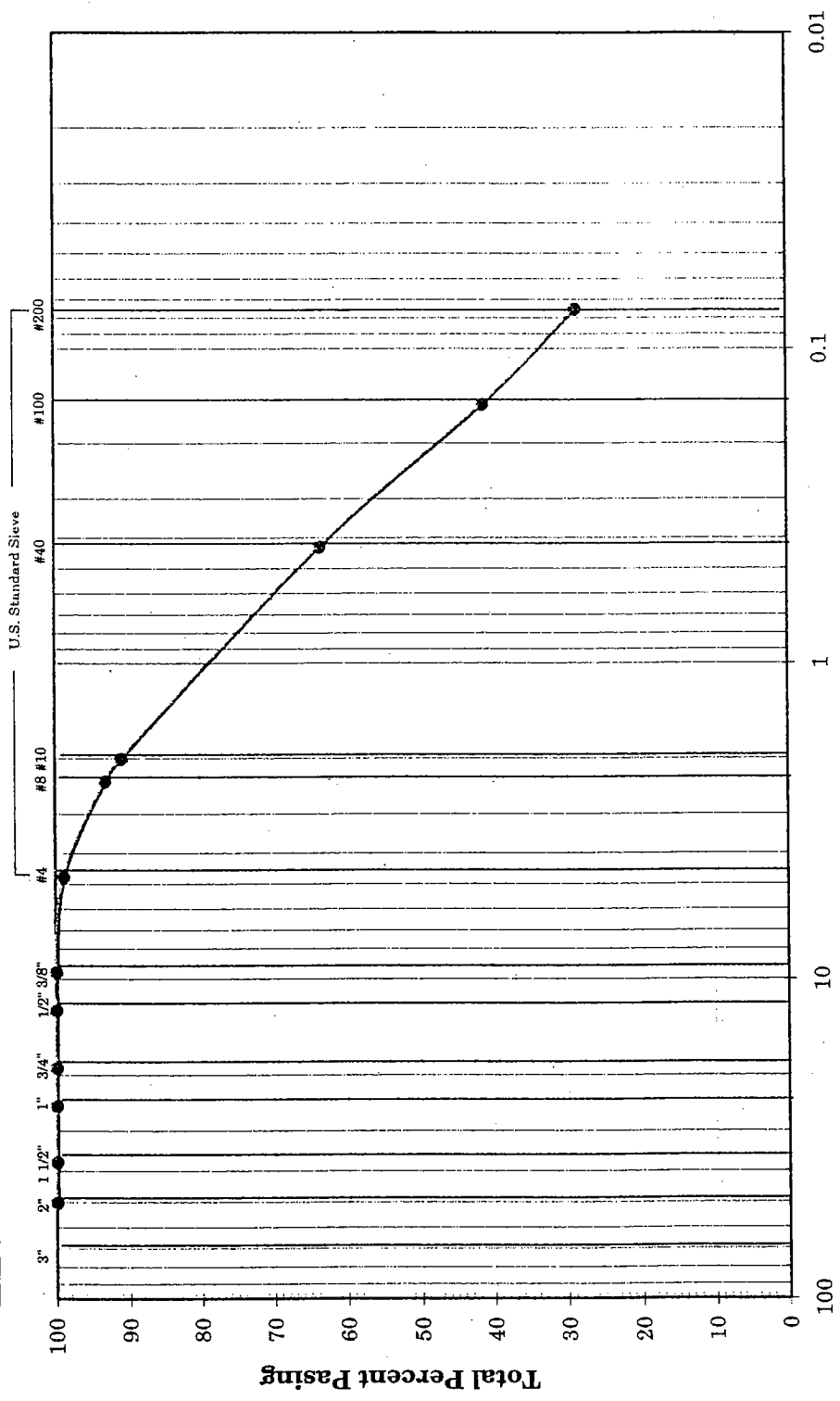
**Earth Systems**  
**Southern California**

2/9/01 PL-05531-01

Sample Location: Boring 26@2'

Sample Description: Clayey Fine to Coarse Sand with Silt (SC)

Gravel		Course Sand	Medium Sand	Fine Sand	Silt or Clay
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Grain Diameter (millimeters)

SIEVE ANALYSIS

Avenue K Transmission Line  
Lancaster, California

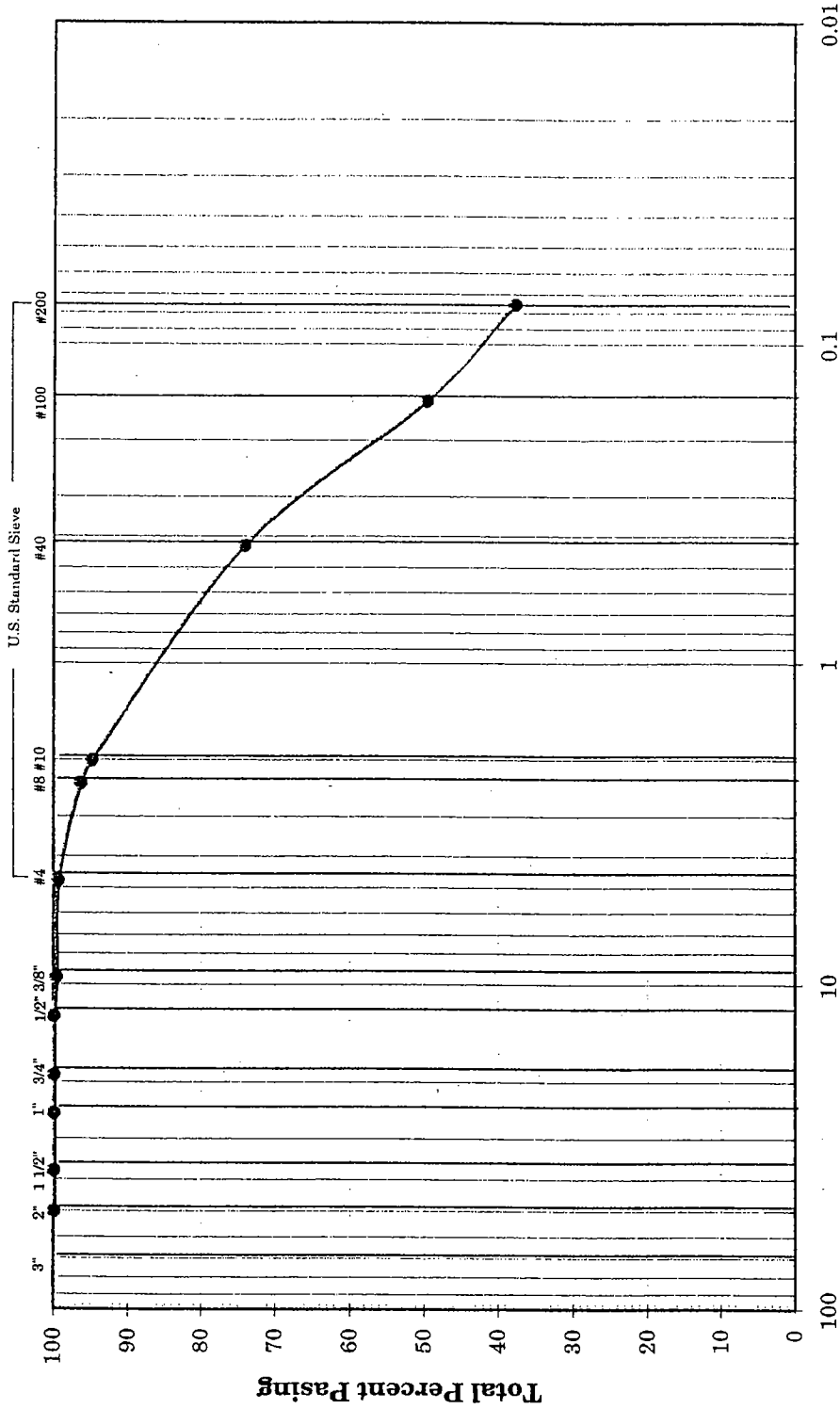


2/9/01 PL-05531-01

Sample Location: Boring 29@2'

Sample Description: Clayey Fine to Coarse Sand (SC)

Gravel	Coarse Sand	Medium Sand	Fine Sand	Silt or Clay
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Grain Diameter (millimeters)

## SIEVE ANALYSIS

Avenue K Transmission Line  
Lancaster, California



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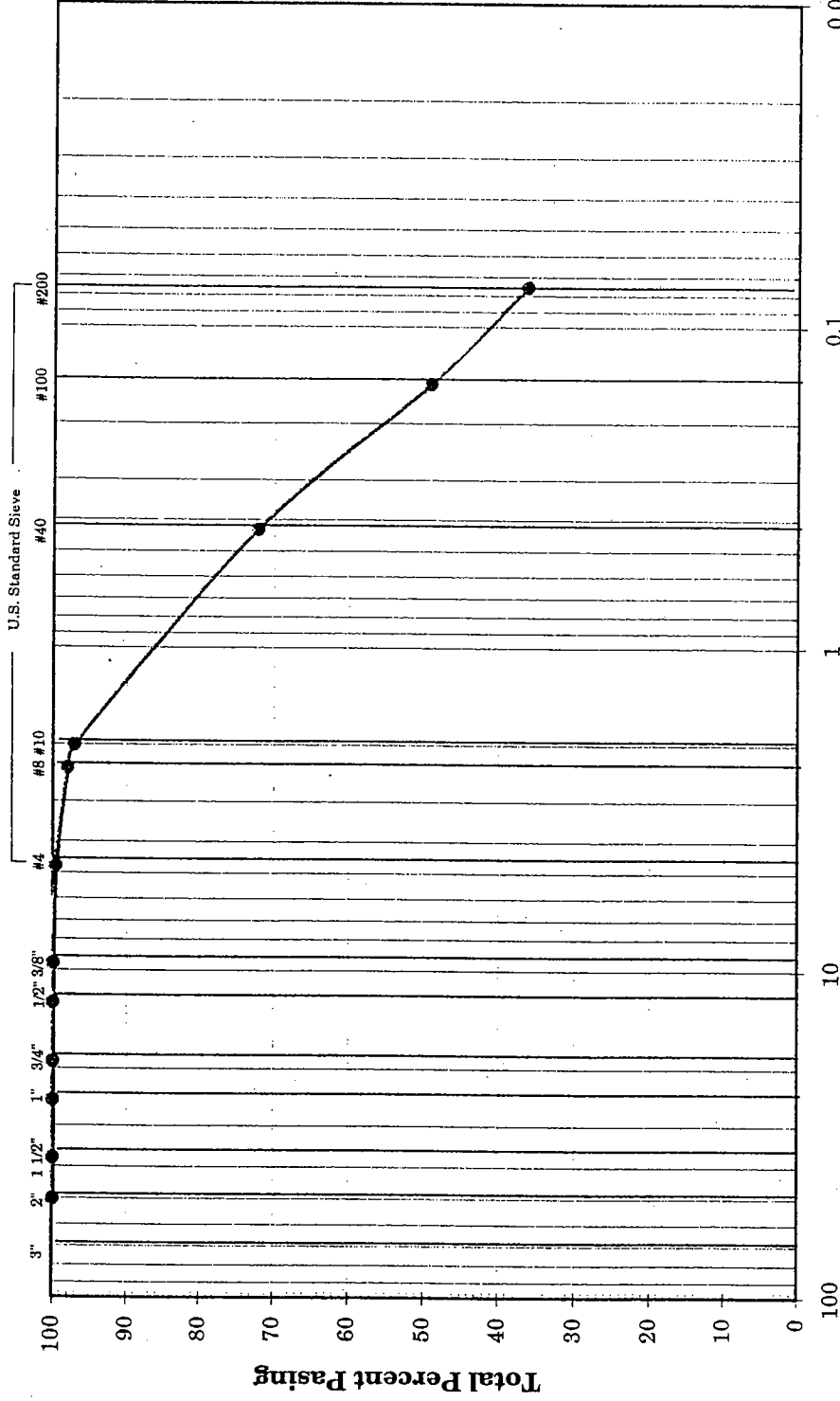
2/9/01 PL-05531-01

Sample Location: Boring 31@2'

Sample Description: Clayey Fine to Medium Sand (SC)



Gravel		Coarse Sand	Medium Sand	Fine Sand	Silt or Clay
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Grain Diameter (millimeters)

## SIEVE ANALYSIS

Avenue K Transmission Line  
Lancaster, California

Sample Location: Boring 32@5'

Sample Description: Silty Fine to Medium Sand with Clay (SM)

**Earth Systems**  
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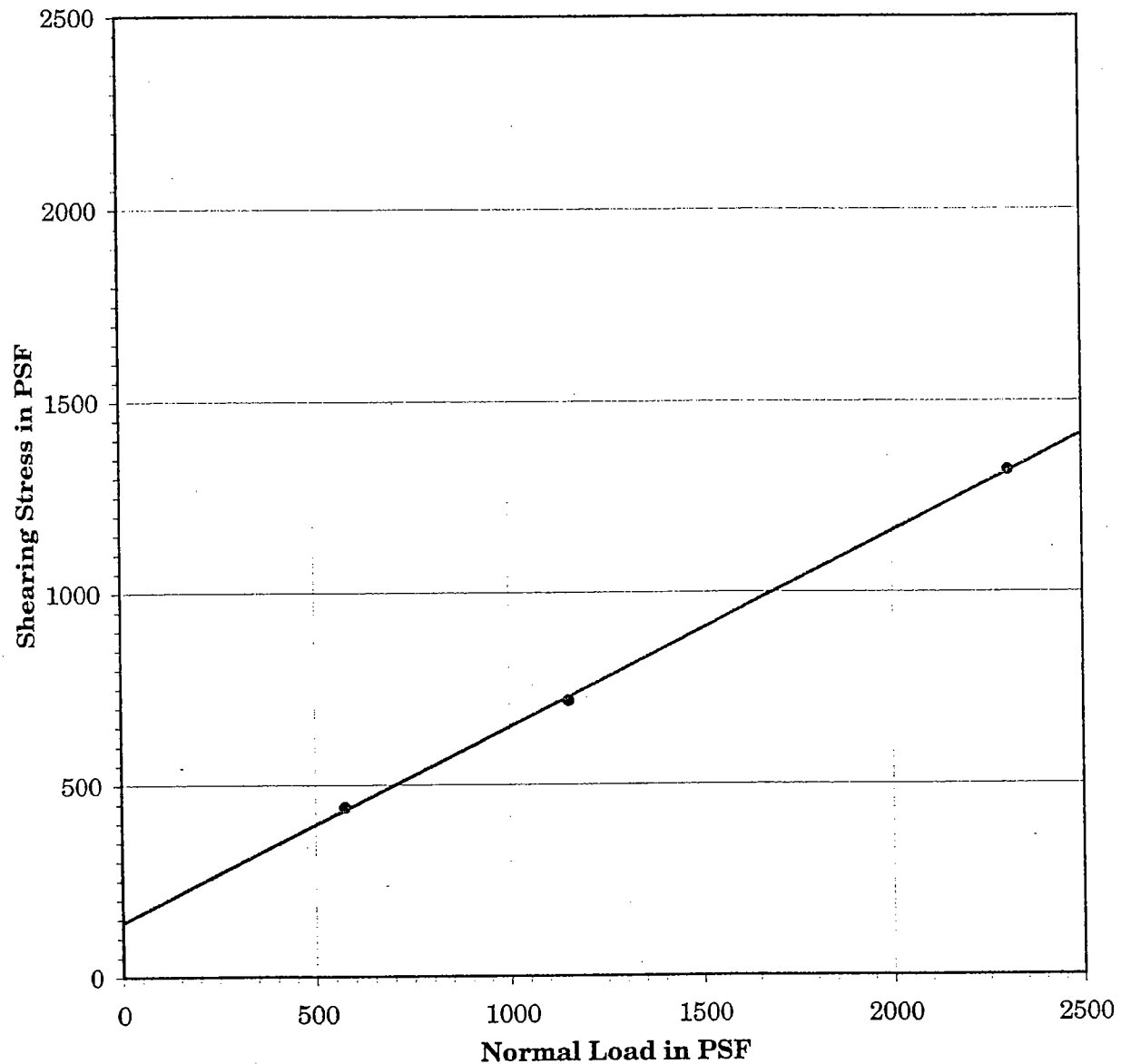
2/9/01 PL-05531-01

TABLE B-I

## SUMMARY OF SAND EQUIVALENT\* TESTING

<u>Sample Location</u>	<u>Material Description</u>	<u>Sand Equivalent</u>
Boring #1 @ 5 feet	Silty Fine to Coarse Sand (SM)	39
Boring #3 @ 7.5 feet	Silty Fine to Coarse Sand (SM)	38
Boring #5 @ 7.5 feet	Silty Fine to Medium Sand (SP)	48
Boring #7 @ 2 feet	Silty Fine Sand (SM)	49
Boring #9 @ 5 feet	Silty Fine to Coarse Sand (SM)	61
Boring #11 @ 5 feet	Fine Sandy Silt (ML)	5
Boring #13 @ 5 feet	Silty Fine to Coarse Sand (SM)	62
Boring #15 @ 5 feet	Silty Fine to Medium Sand (SM)	36
Boring #17 @ 7.5 feet	Silty Fine to Medium Sand (SM)	23
Boring #19 @ 5 feet	Silty Fine to Coarse Sand (SM)	73
Boring #21 @ 5 feet	Fine Sandy Silt (ML)	5
Boring #23 @ 7.5 feet	Fine Sandy Clay with Silt (CL)	7
Boring #25 @ 5 feet	Fine Sandy Silt (ML)	23
Boring #27 @ 7.5 feet	Silty Fine to Coarse Sand (SM)	48
Boring #29 @ 7.5 feet	Fine Sandy Clay with Silt (CL)	13
Boring #31 @ 5 feet	Silty Fine to Medium Sand (SM)	29

\*California Test Method 217



#### DIRECT SHEAR DATA\*

Sample Location: Boring 26@5', in-situ.

Material: Pale Yellow Brown Silty Clay (CL)

Dry Density (pcf): 93.3

$\phi$  Angle of Friction (degrees): 27

c Cohesive Strength (psf): 140

Test Type: Peak

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

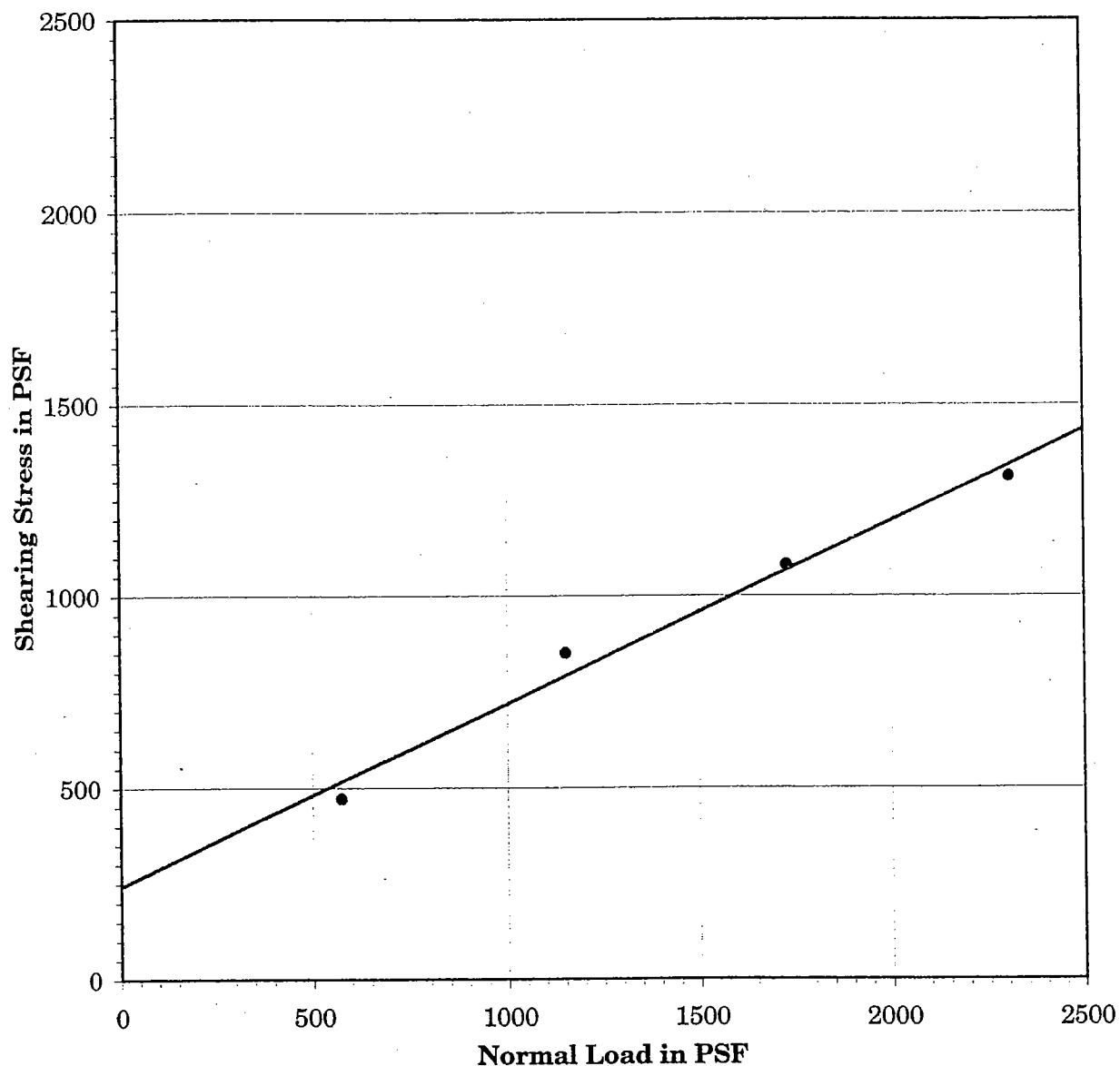
**Avenue K Transmission Line  
Lancaster, California**



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#### DIRECT SHEAR DATA\*

Sample Location: Boring 28@5', in-situ.

Material: Pale Yellow Brown Silty Clay with Fine Sand (CL)

Dry Density (pcf): 88.2

$\phi$  Angle of Friction (degrees): 26

c Cohesive Strength (psf): 240

Test Type: Peak

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

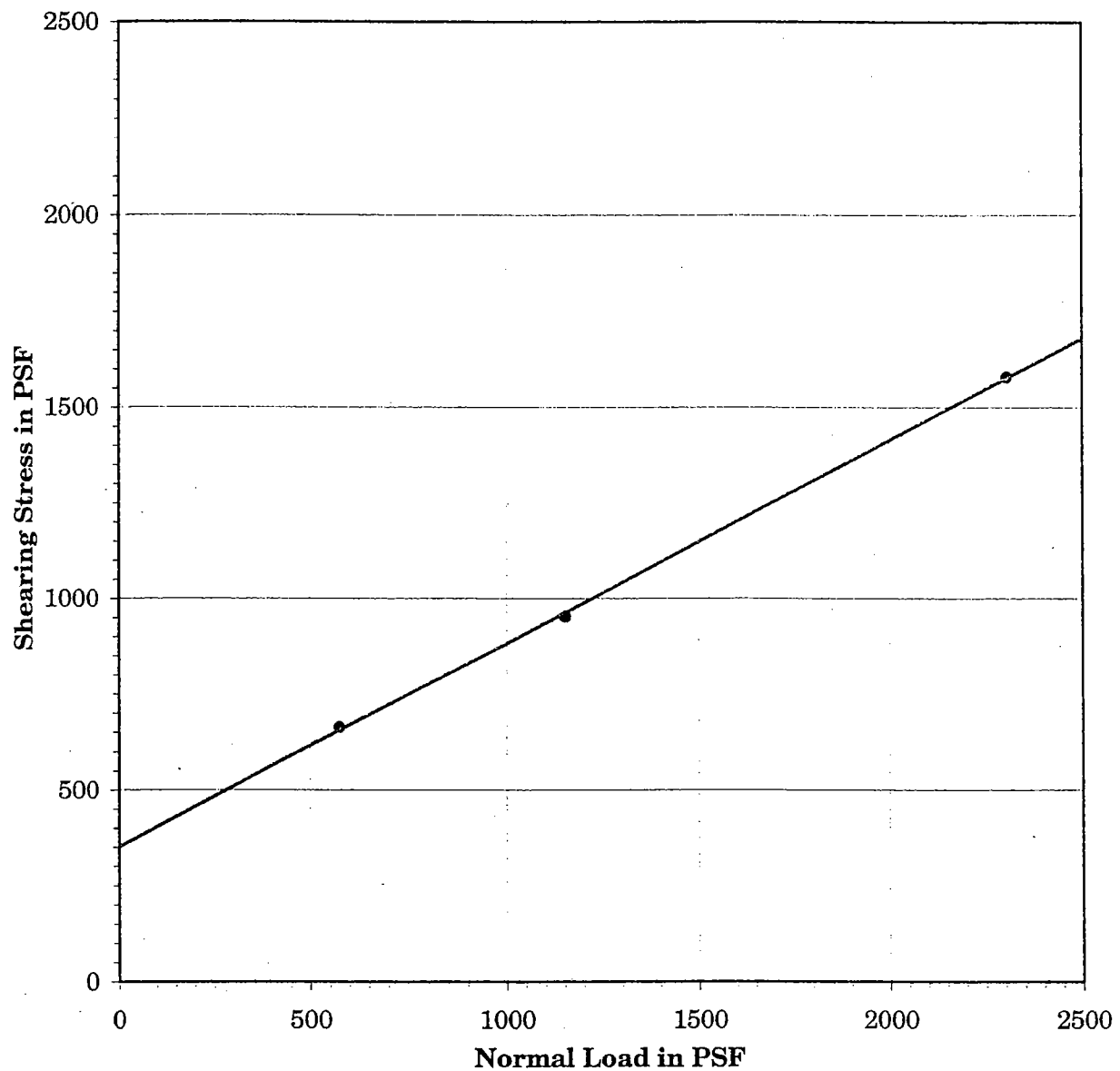
**Avenue K Transmission Line  
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#### DIRECT SHEAR DATA\*

Sample Location: Boring 30@2', in-situ.

Material: Pale Yellow Brown Fine to Coarse Sandy Clay (CL)

Dry Density (pcf): 94.4

$\phi$  Angle of Friction (degrees): 28

c Cohesive Strength (psf): 350

Test Type: Peak

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

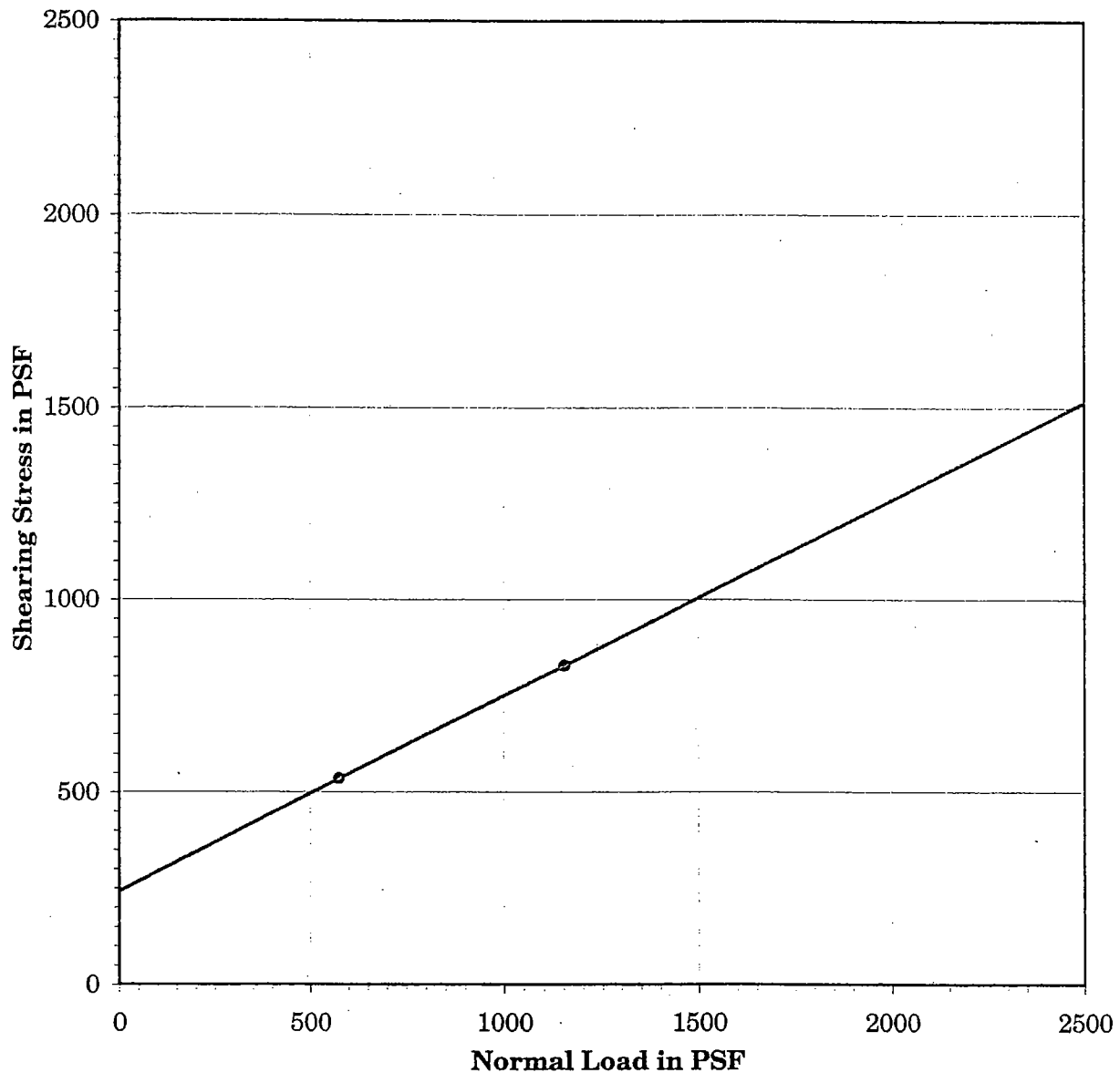
Avenue K Transmission Line  
Lancaster, California



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#### DIRECT SHEAR DATA\*

Sample Location: Boring 32@2', in-situ.

Material: Pale Yellow Brown Fine Sandy Clay with Silt (CL)

Dry Density (pcf): 97

$\phi$  Angle of Friction (degrees): 27

c Cohesive Strength (psf): 240

Test Type: Peak

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

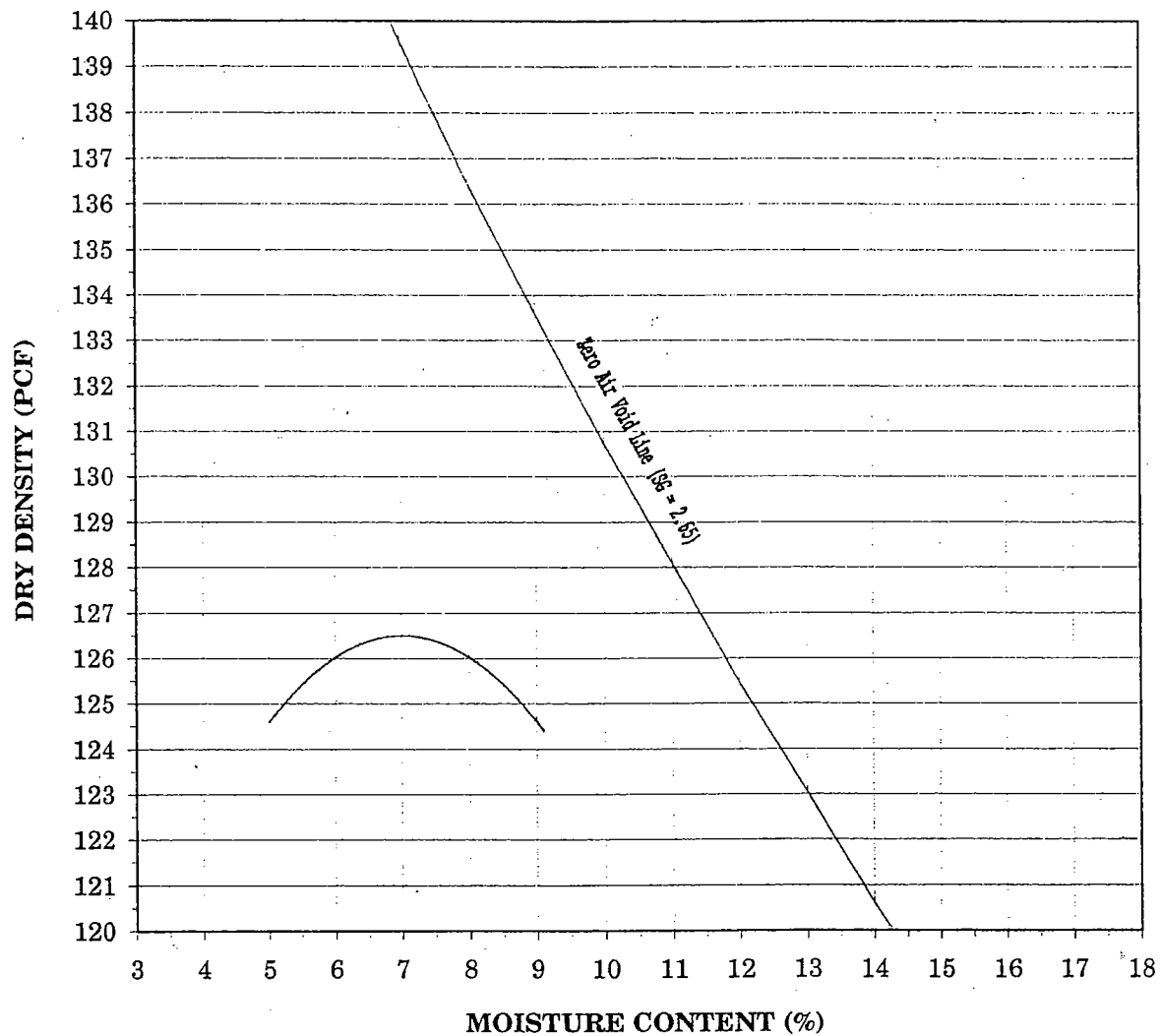
**Avenue K Transmission Line  
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**Maximum Density - Optimum Moisture Characteristics\***

Sample Location: Boring 1@0-5'

Material: Dk Yellow Brown Silty Fine to Medium Sand (SM)

Maximum Density (pcf): 126.5

Optimum Moisture: 7.0%

\* Test Method: ASTM D-1557

**MAXIMUM DENSITY - OPTIMUM MOISTURE**

**Avenue K Transmission Line**

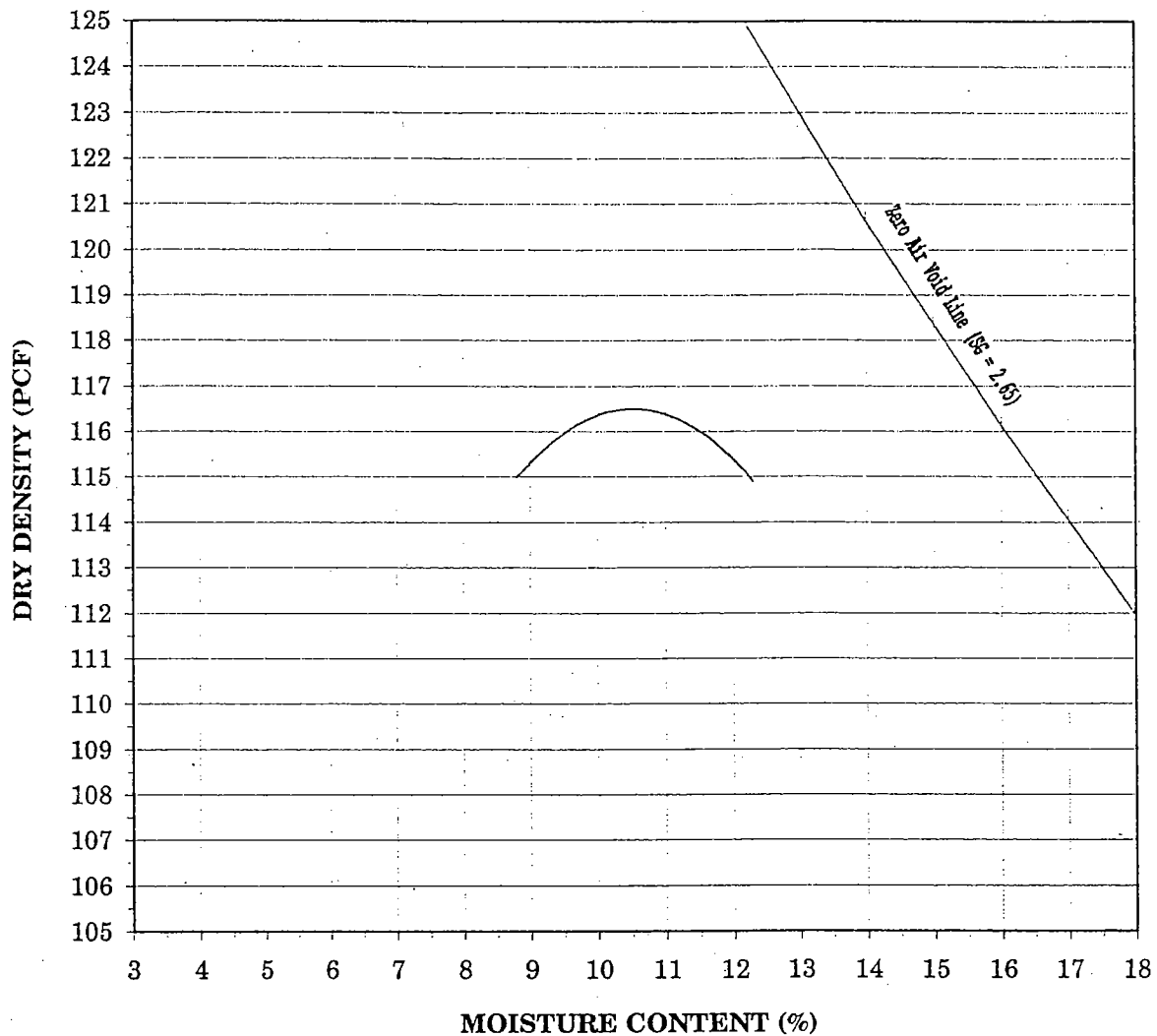
**Lancaster, California**



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**Maximum Density - Optimum Moisture Characteristics\***

Sample Location: Boring 7@0-5'

Material: Dark Yellow Brown Silty Fine Sand (SM)

Maximum Density (pcf): 116.5

Optimum Moisture: 10.5%

\* Test Method: ASTM D-1557

**MAXIMUM DENSITY - OPTIMUM MOISTURE**

**Avenue K Transmission Line**

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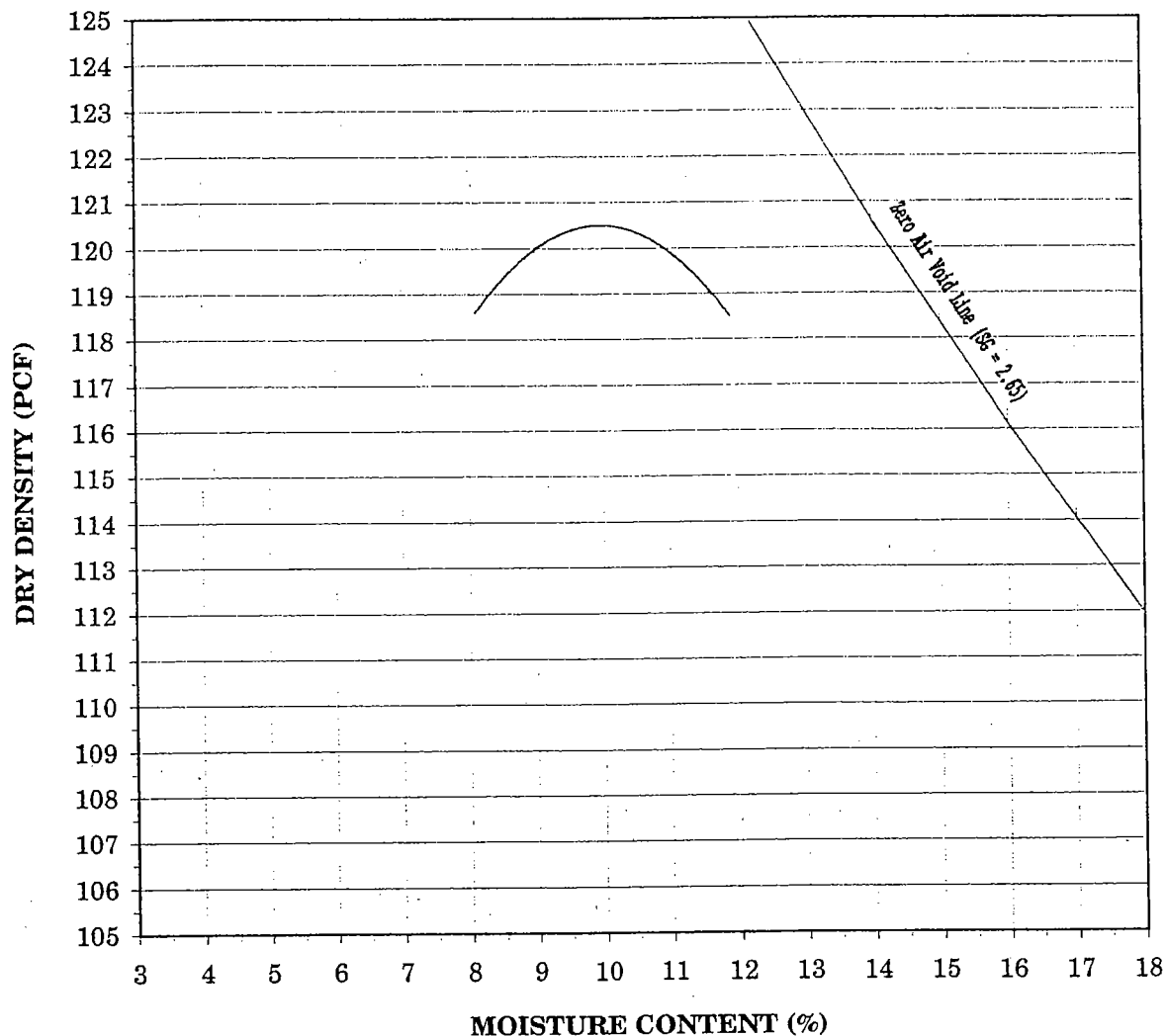


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**Maximum Density - Optimum Moisture Characteristics\***

Sample Location: Boring 11@0-5'

Material: Dark Yellow Brown Very Silty Fine Sand (SM)

Maximum Density (pcf): 120.5

Optimum Moisture: 10.0%

\* Test Method: ASTM D-1557

**MAXIMUM DENSITY - OPTIMUM MOISTURE**

**Avenue K Transmission Line**

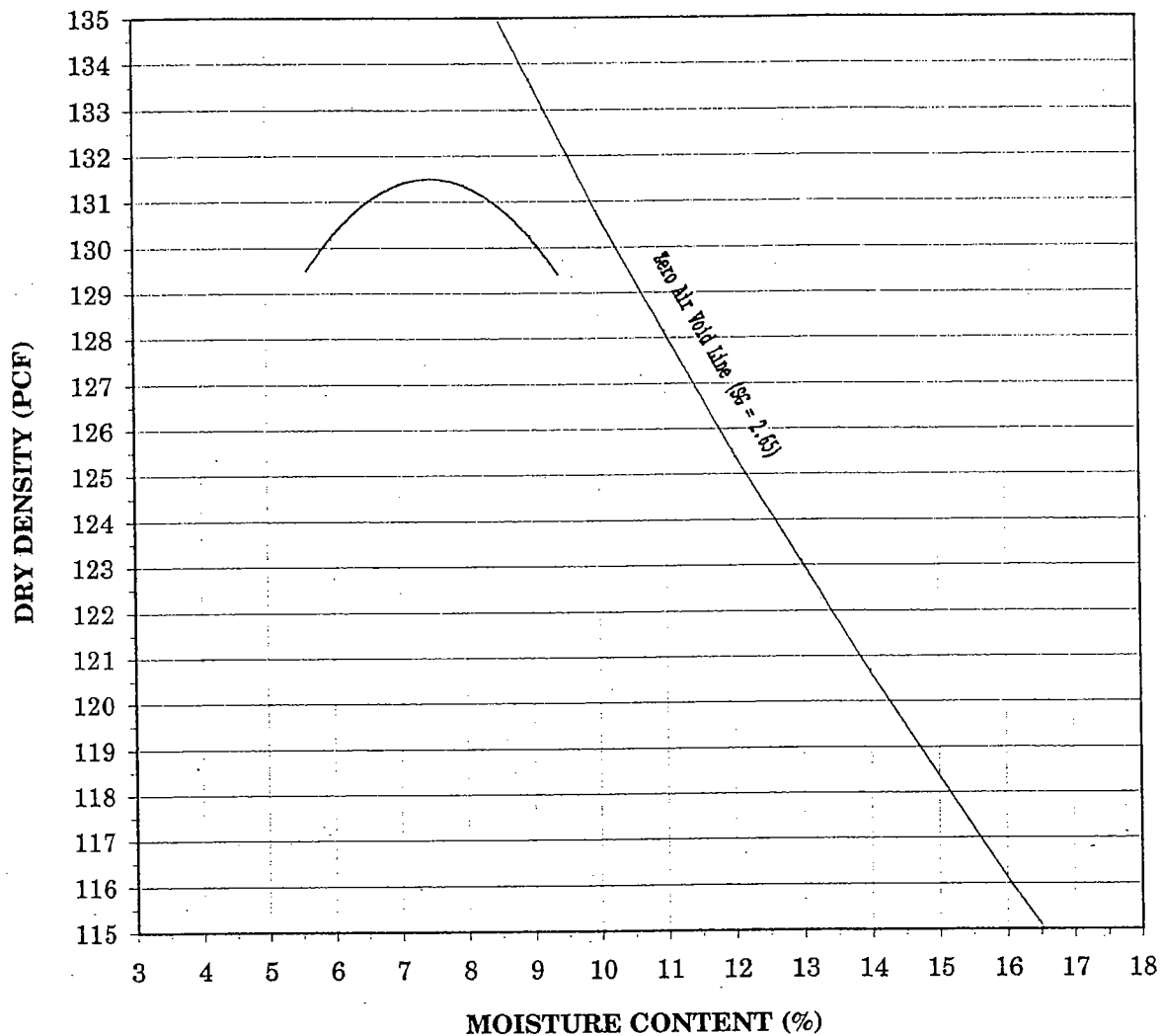
**Lancaster, California**



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**Maximum Density - Optimum Moisture Characteristics\***

Sample Location: Boring 15@0-5'

Material: Moderate Brown Silty Fine Sand (SM)

Maximum Density (pcf): 131.5

Optimum Moisture: 7.5%

\* Test Method: ASTM D-1557

**MAXIMUM DENSITY - OPTIMUM MOISTURE**

**Avenue K Transmission Line**

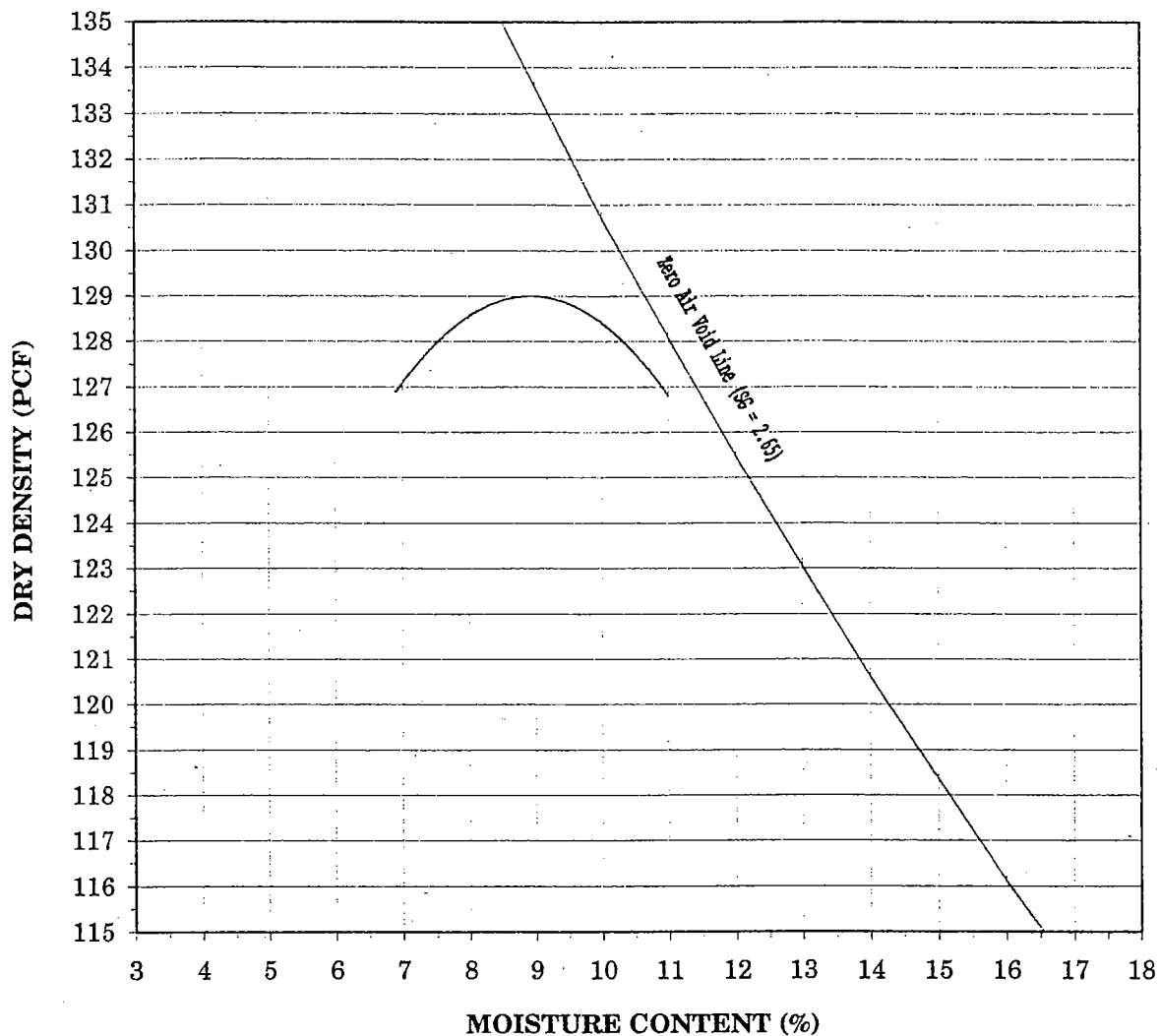
**Lancaster, California**



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**Maximum Density - Optimum Moisture Characteristics\***

Sample Location: Boring 23@0-5'

Material: Dark Yellow Brown Silty Fine to Coarse Sand (SM)

Maximum Density (pcf): 129.0

Optimum Moisture: 9.0%

\* Test Method: ASTM D-1557

**MAXIMUM DENSITY - OPTIMUM MOISTURE**

**Avenue K Transmission Line**

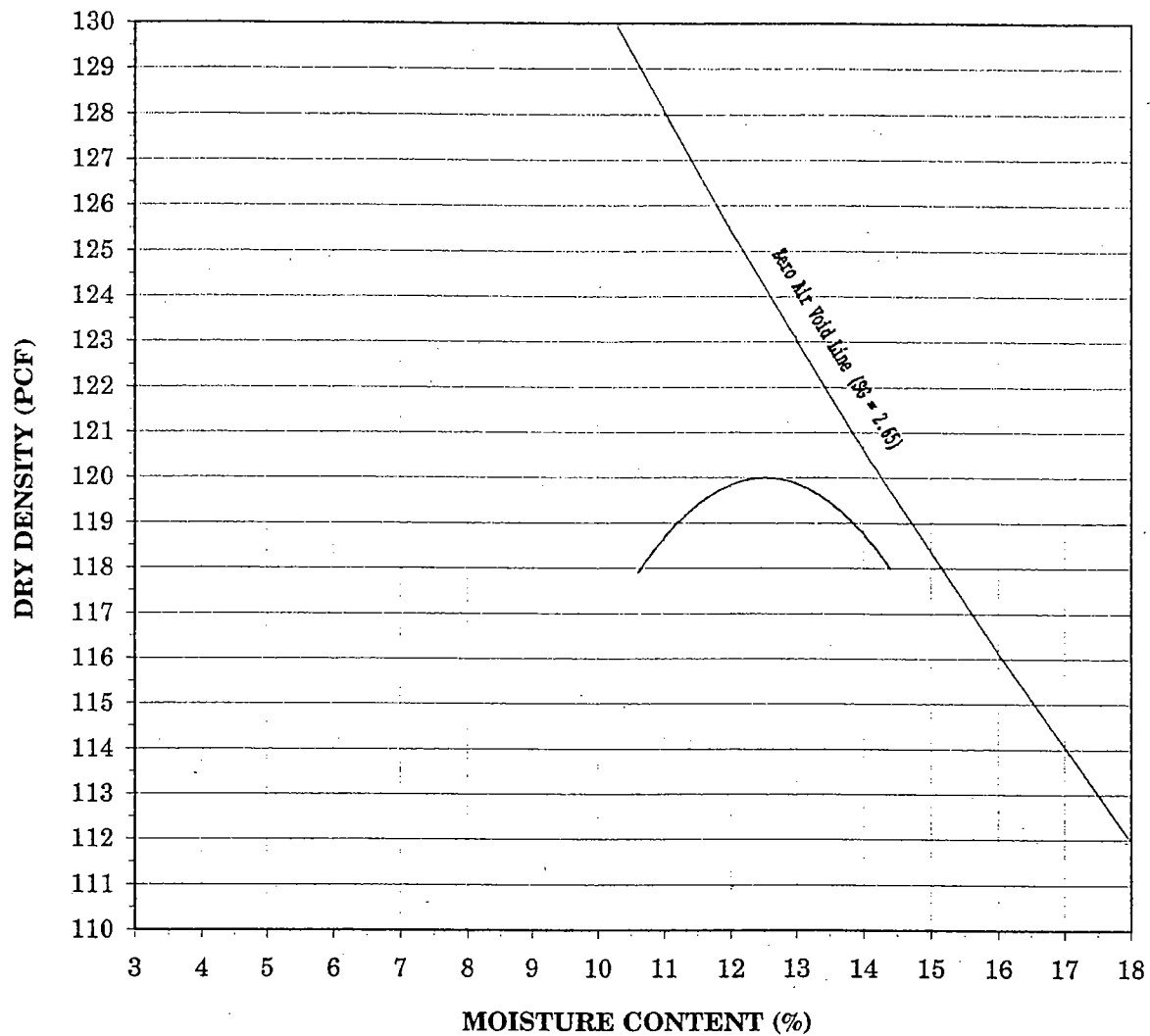
**Lancaster, California**



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**Maximum Density - Optimum Moisture Characteristics\***

Sample Location: Boring 27@0-5'

Material: Very Pale Orange Fine Sandy Clay (CL)

Maximum Density (pcf): 120.0

Optimum Moisture: 12.5%

\* Test Method: ASTM D-1557

**MAXIMUM DENSITY - OPTIMUM MOISTURE**

**Avenue K Transmission Line**

**Lancaster, California**



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Test Method: ASTM D-1557

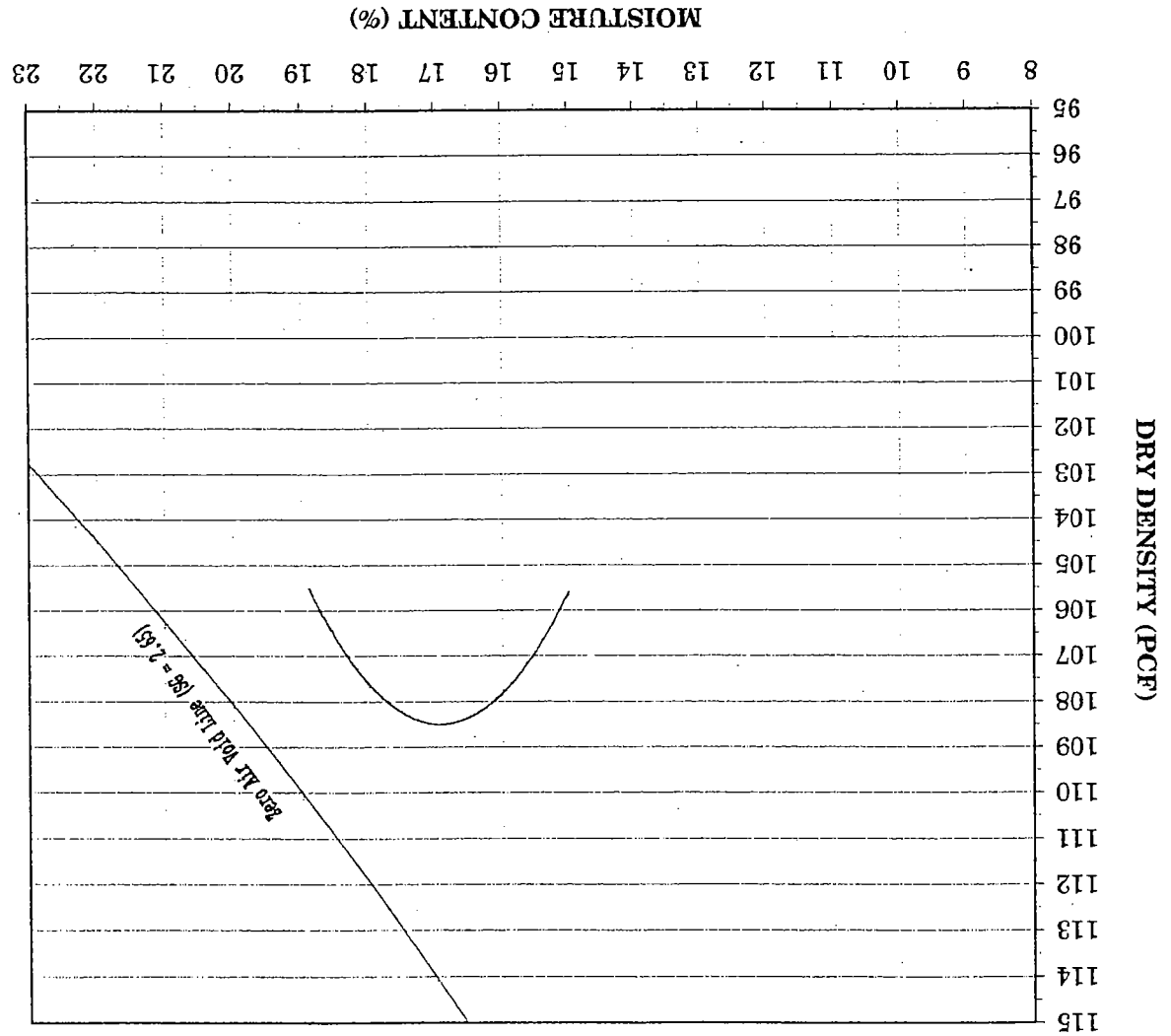
Optimum Moisture: 17.0%

Maximum Density (pcf): 108.5

Material: Pale Yellow Brown Fine Sandy Clay (CL)

Sample Location: Boring 28@0-5'

Maximum Density - Optimum Moisture Characteristics\*



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Avenue K Transmission Line  
Lancaster, California

MAXIMUM DENSITY - OPTIMUM MOISTURE

Test Method: ASTM D-1557

Optimum Moisture: 15.0%

Maximum Density (pcf): 113.5

Material: Pale Yellow Brown Fine Sandy Clay (CL)

Sample Location: Boring 32@0-5'

Maximum Density - Optimum Moisture Characteristics

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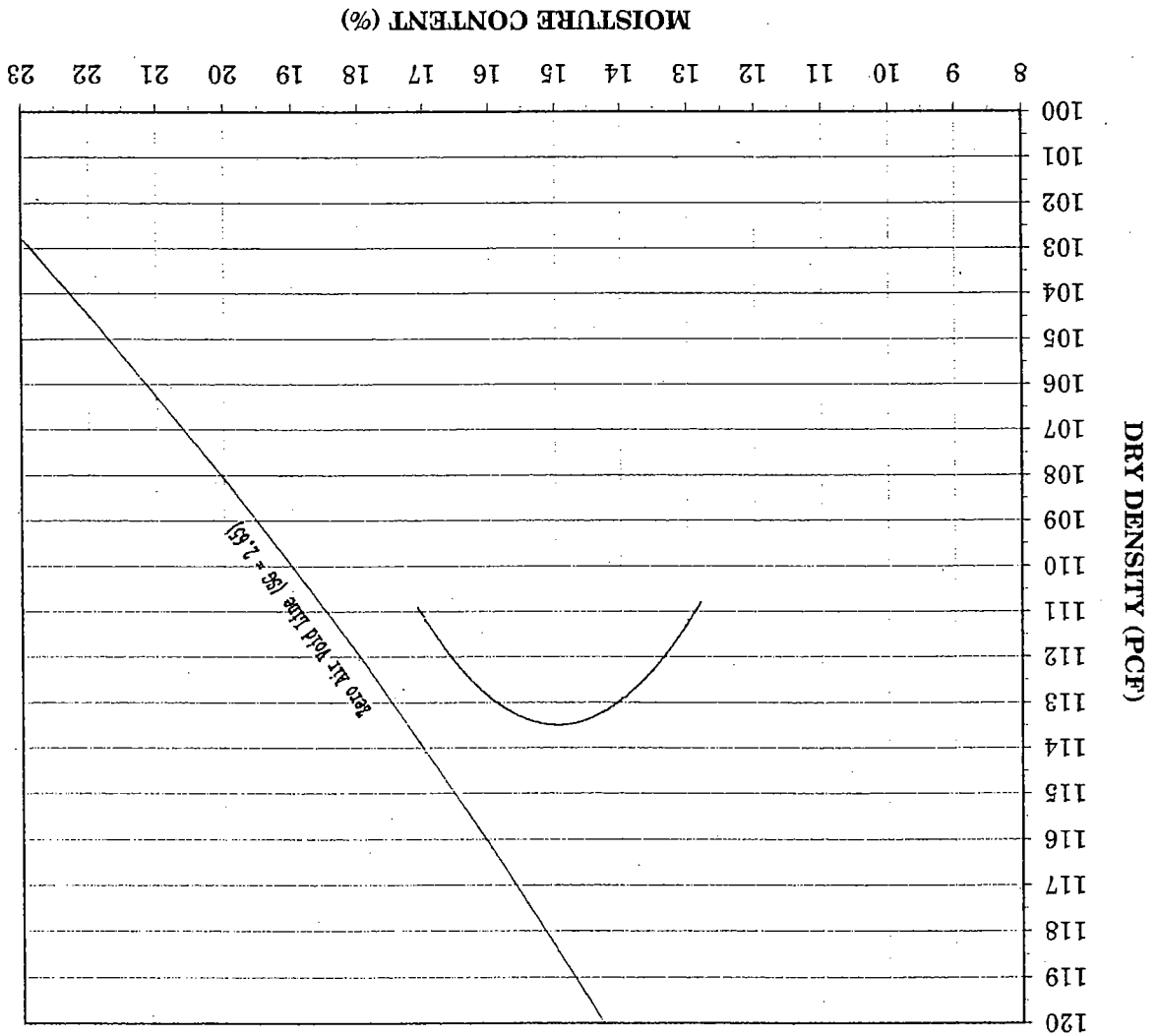
PL-05531-01

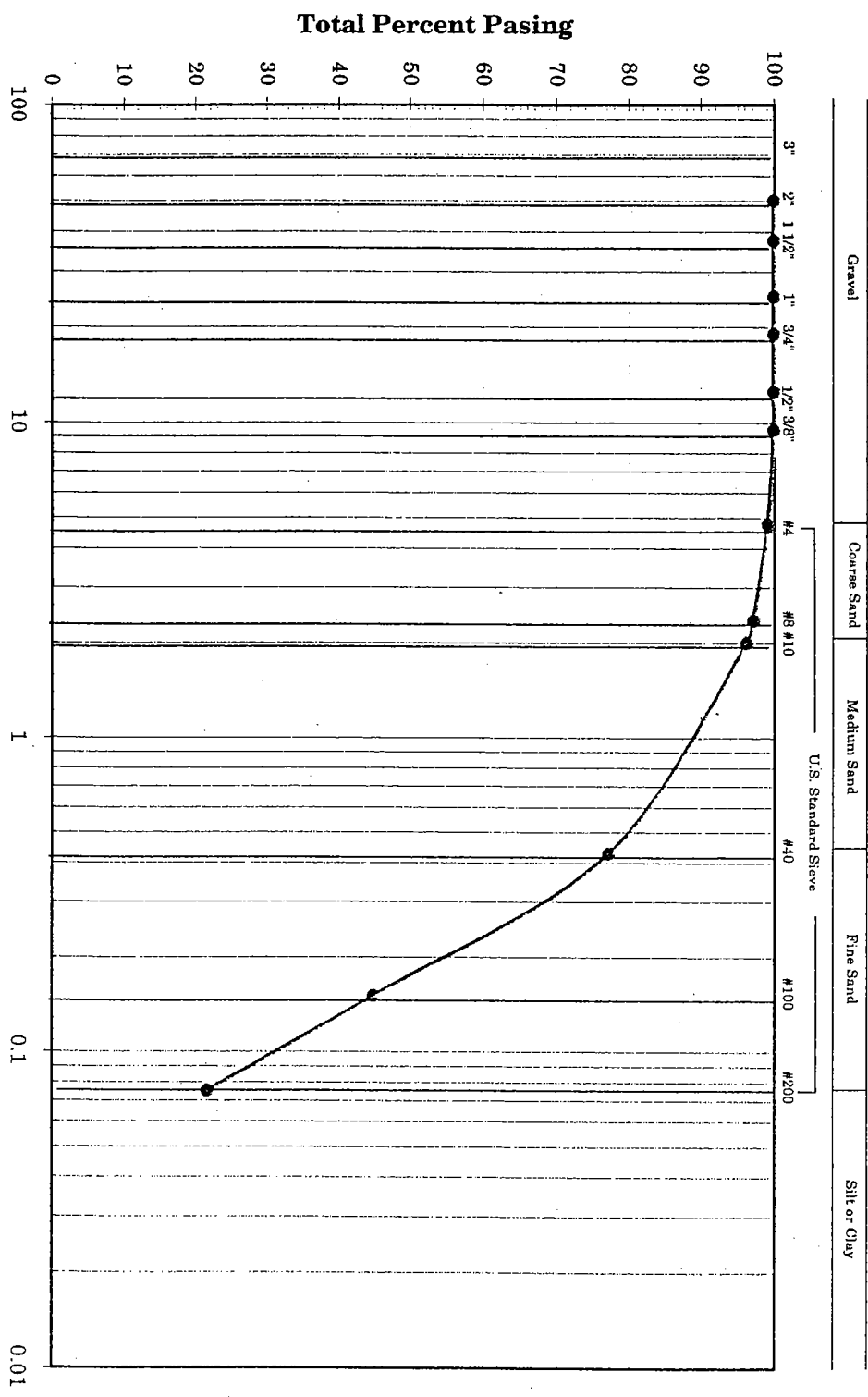
Earth Systems  
Southern California



Avenue K Transmission Line  
Lancaster, California


MAXIMUM DENSITY - OPTIMUM MOISTURE

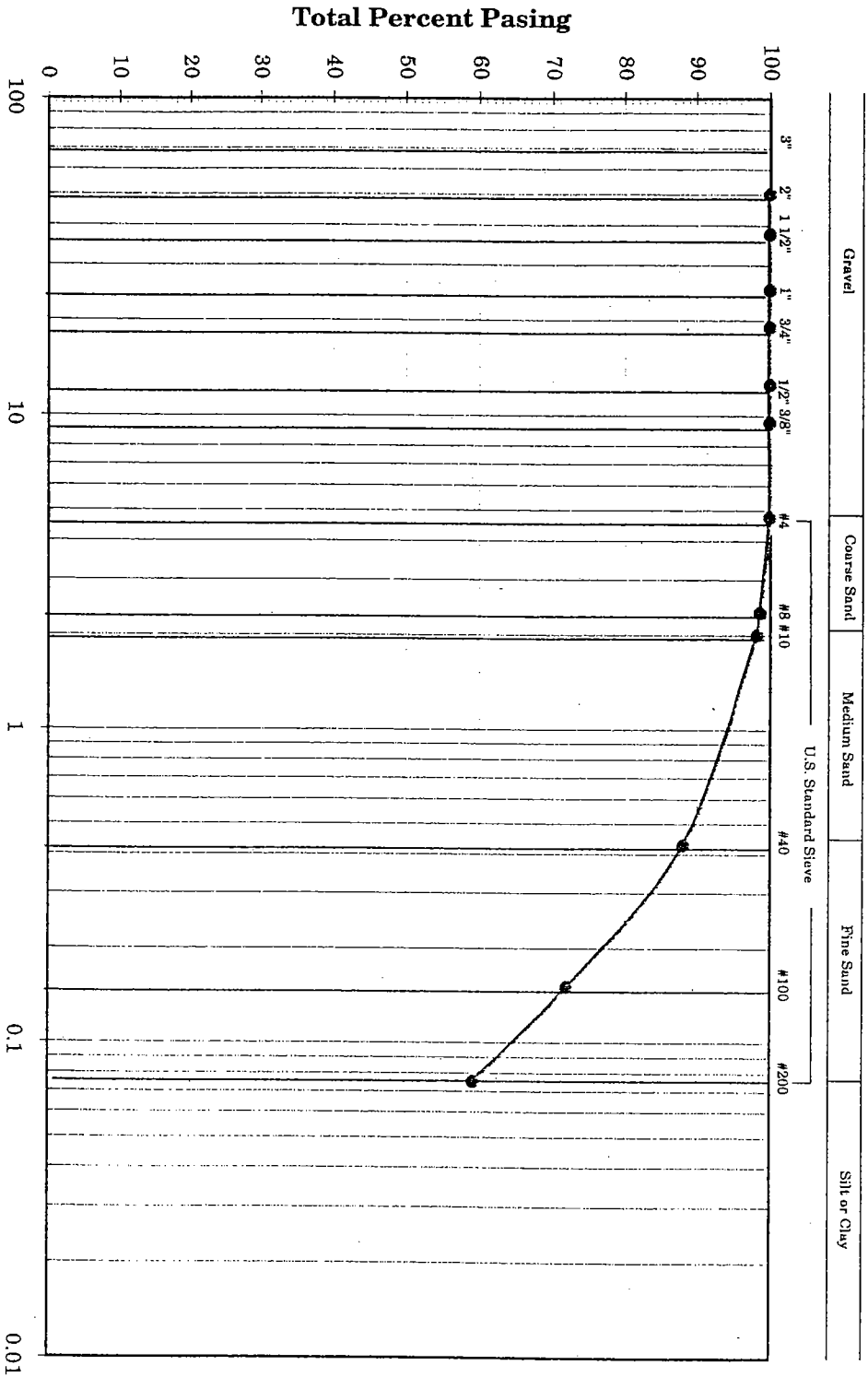




Grain Diameter (millimeters)

Sample Location: Boring 1@2'  
 Sample Description: Silty Fine to Medium Sand (SM)

<b>SIEVE ANALYSIS</b>	
Avenue K Transmission Line	
Lancaster, California	
 <b>Earth Systems</b> <b>Southern California</b>	
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Grain Diameter (millimeters)

Sample Location: Boring 3@2'  
Sample Description: Fine to Medium Sandy Silt (ML)

# SIEVE ANALYSIS

Avenue K Transmission Line  
Lancaster, California

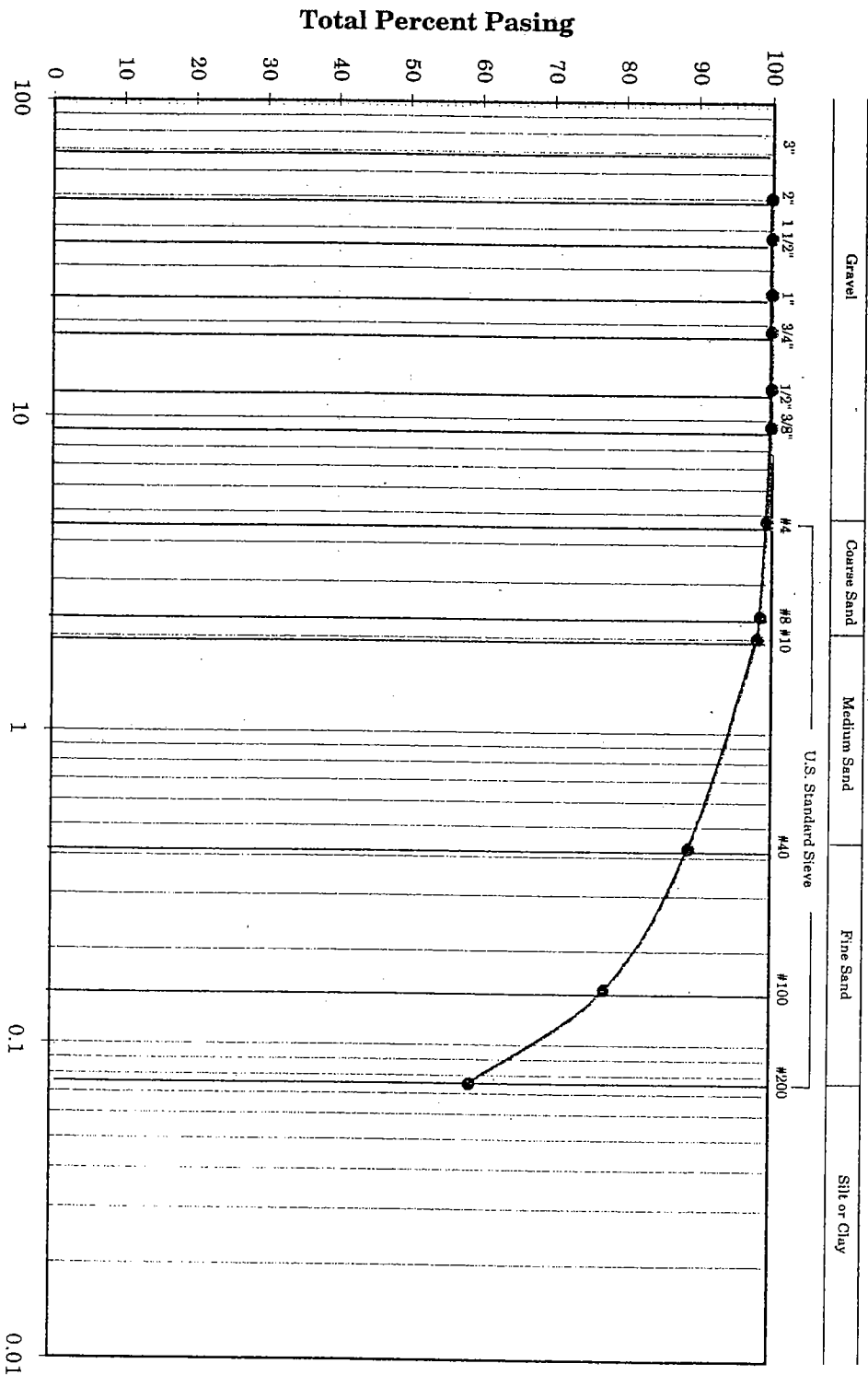


**Earth Systems**  
**Southern California**

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Sample Location: Boring 4@7.5'

Sample Description: Fine to Medium Sandy Silt (ML)

Grain Diameter (millimeters)

**SIEVE ANALYSIS**

Avenue K Transmission Line  
Lancaster, California

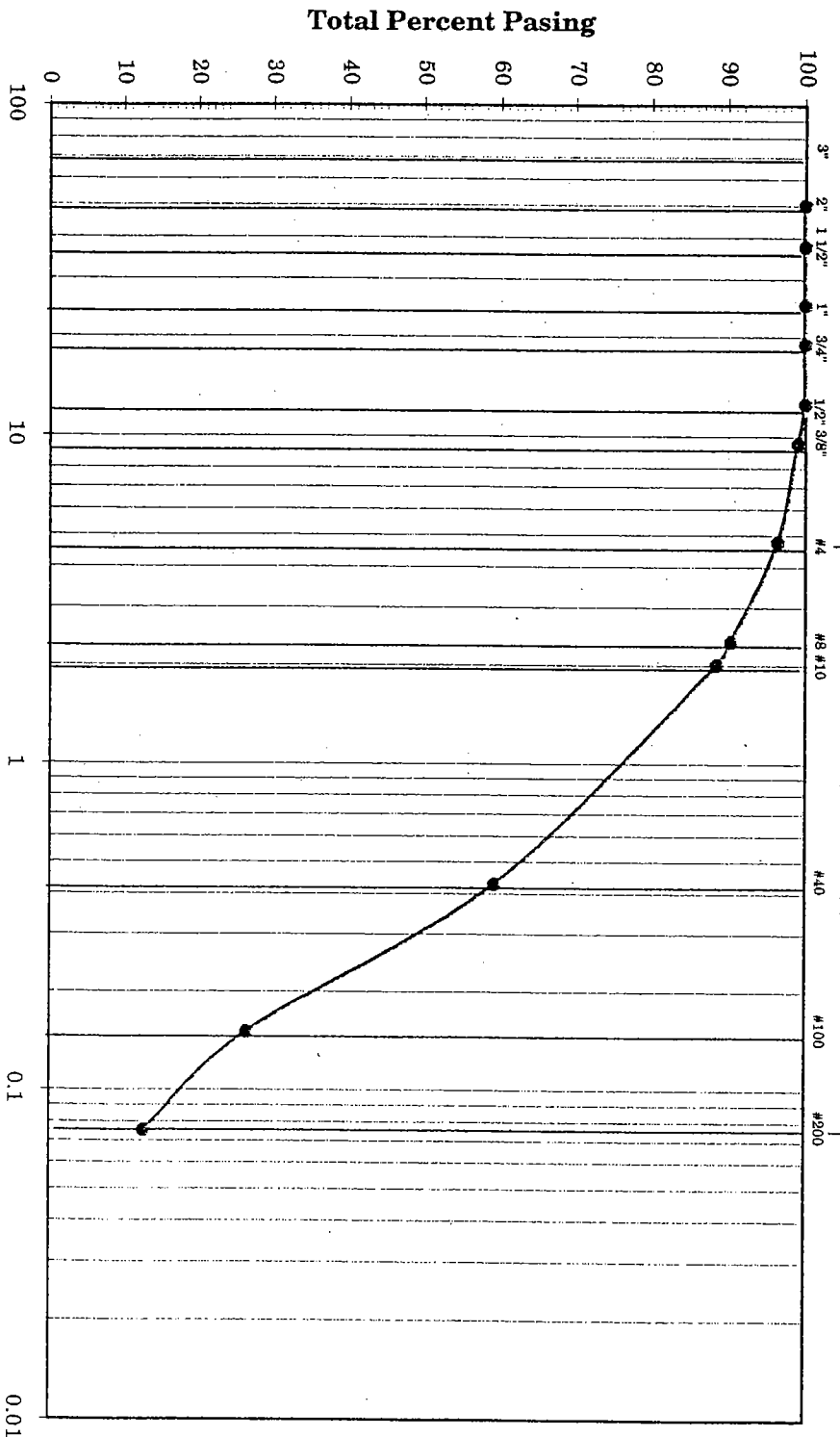


**Earth Systems**  
**Southern California**

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Gravel	Coarse Sand	Medium Sand	Fine Sand	Silt or Clay
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Grain Diameter (millimeters)

SIEVE ANALYSIS

Sample Location: Boring 6@5'  
Sample Description: Silty Fine to Medium Sand (SM)

 <b>Earth Systems</b> Southern California	
Avenue K Transmission Line Lancaster, California	
2/9/01	PL-05531-01

Sample Location: Boring 9@2'  
 Sample Description: Silty Fine Sand (SM)

Grain Diameter (millimeters)

SIEVE ANALYSIS

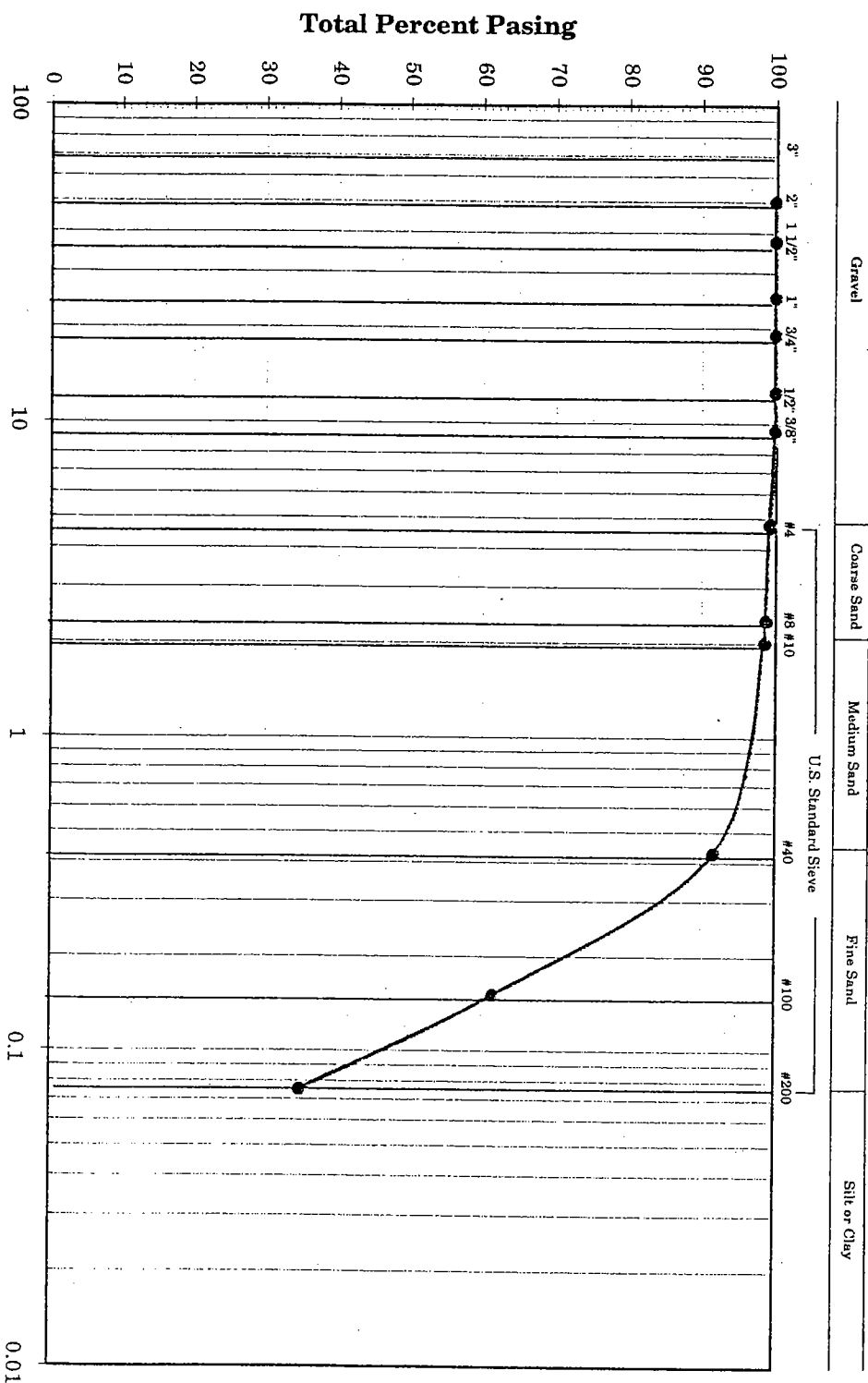
Avenue K Transmission Line  
 Lancaster, California

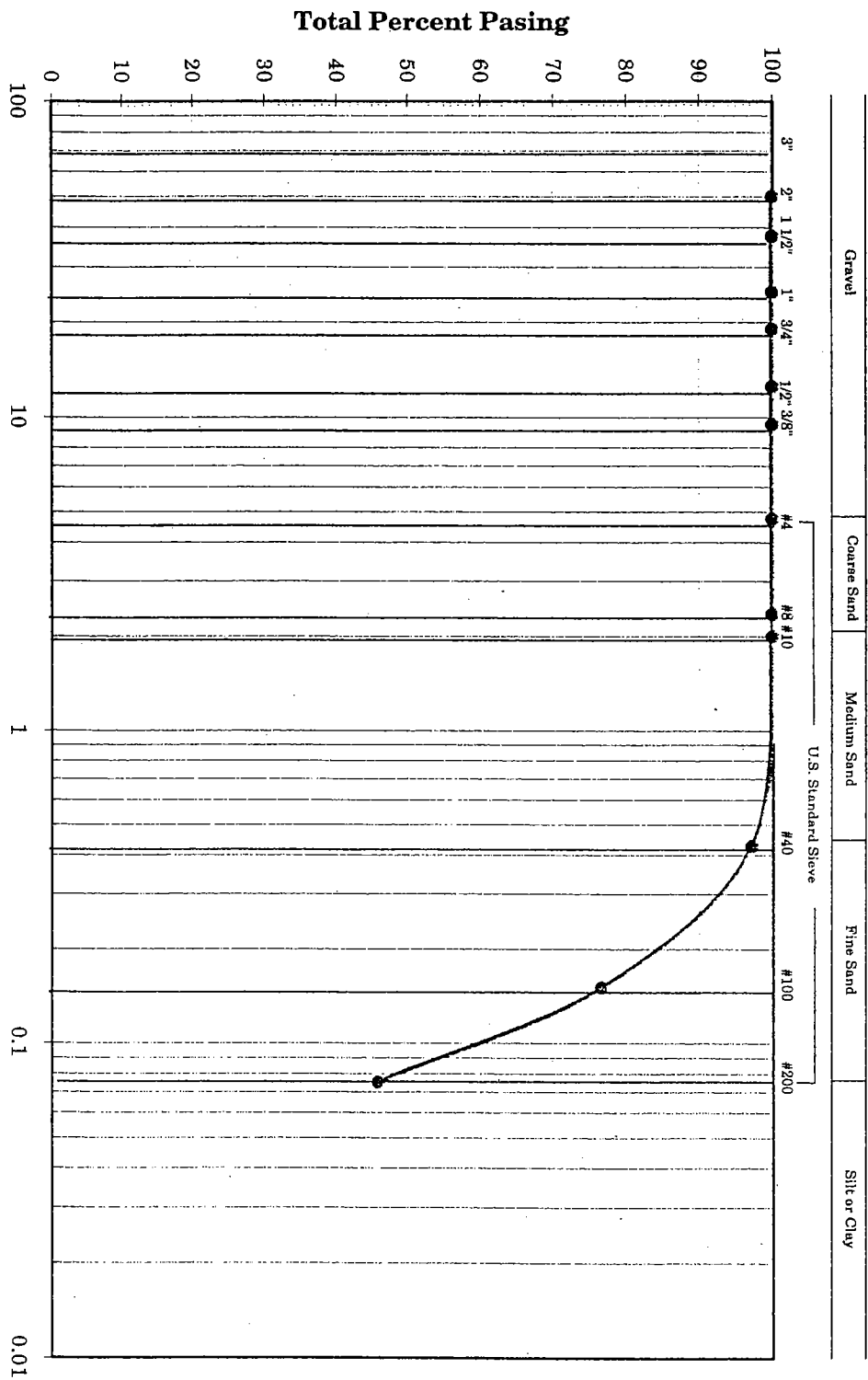


**Earth Systems**  
**Southern California**

2/9/01

PL-05531-01





Sample Location: Boring 11@7.5'

Sample Description: Silty Fine Sand (SM)

Grain Diameter (millimeters)

SIEVE ANALYSIS

Avenue K Transmission Line  
Lancaster, California

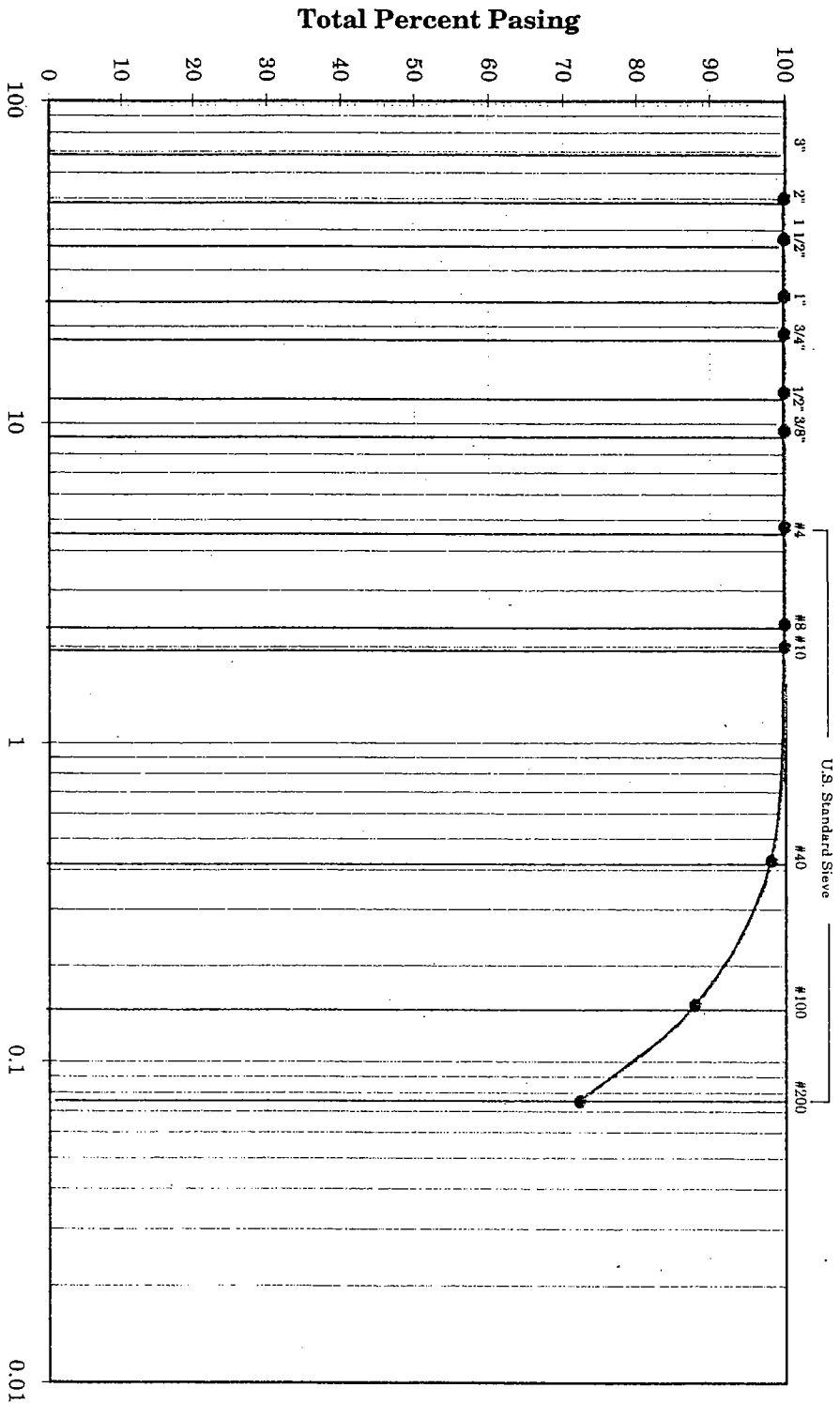


**Earth Systems**  
**Southern California**

2/9/01


PL-05531-01

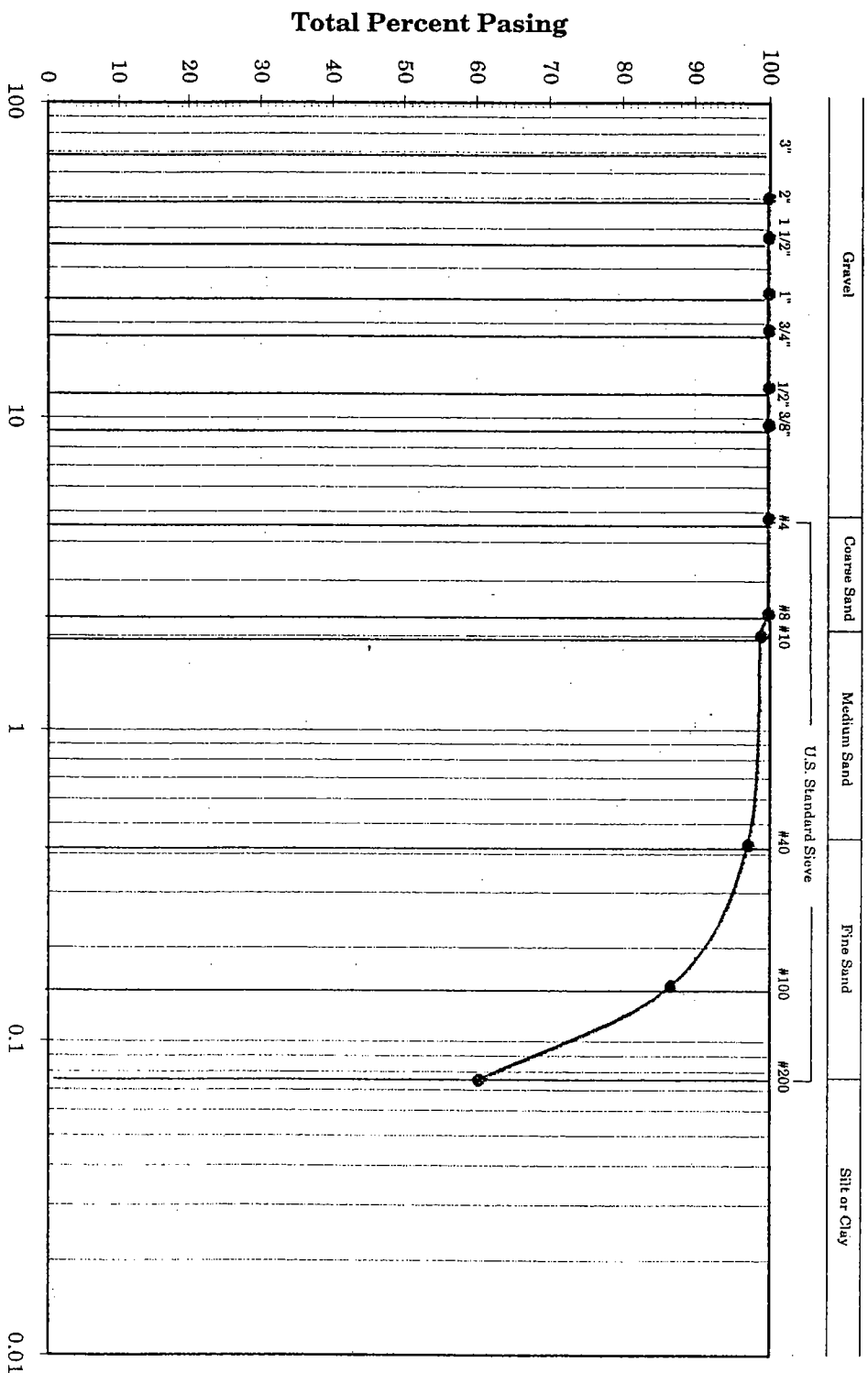
Gravel	Coarse Sand	Medium Sand	Fine Sand	Silt or Clay
--------	-------------	-------------	-----------	--------------



Grain Diameter (millimeters)

Sample Location: Boring 12@7.5'  
Sample Description: Fine Sandy Silt (ML)

<b>SIEVE ANALYSIS</b>	
Avenue K Transmission Line	
Lancaster, California	
 <b>Earth Systems</b> <b>Southern California</b>	
2/9/01	PL-05531-01



Sample Location: Boring 15@7.5'

Sample Description: Fine Sandy Silt (ML)

### SIEVE ANALYSIS

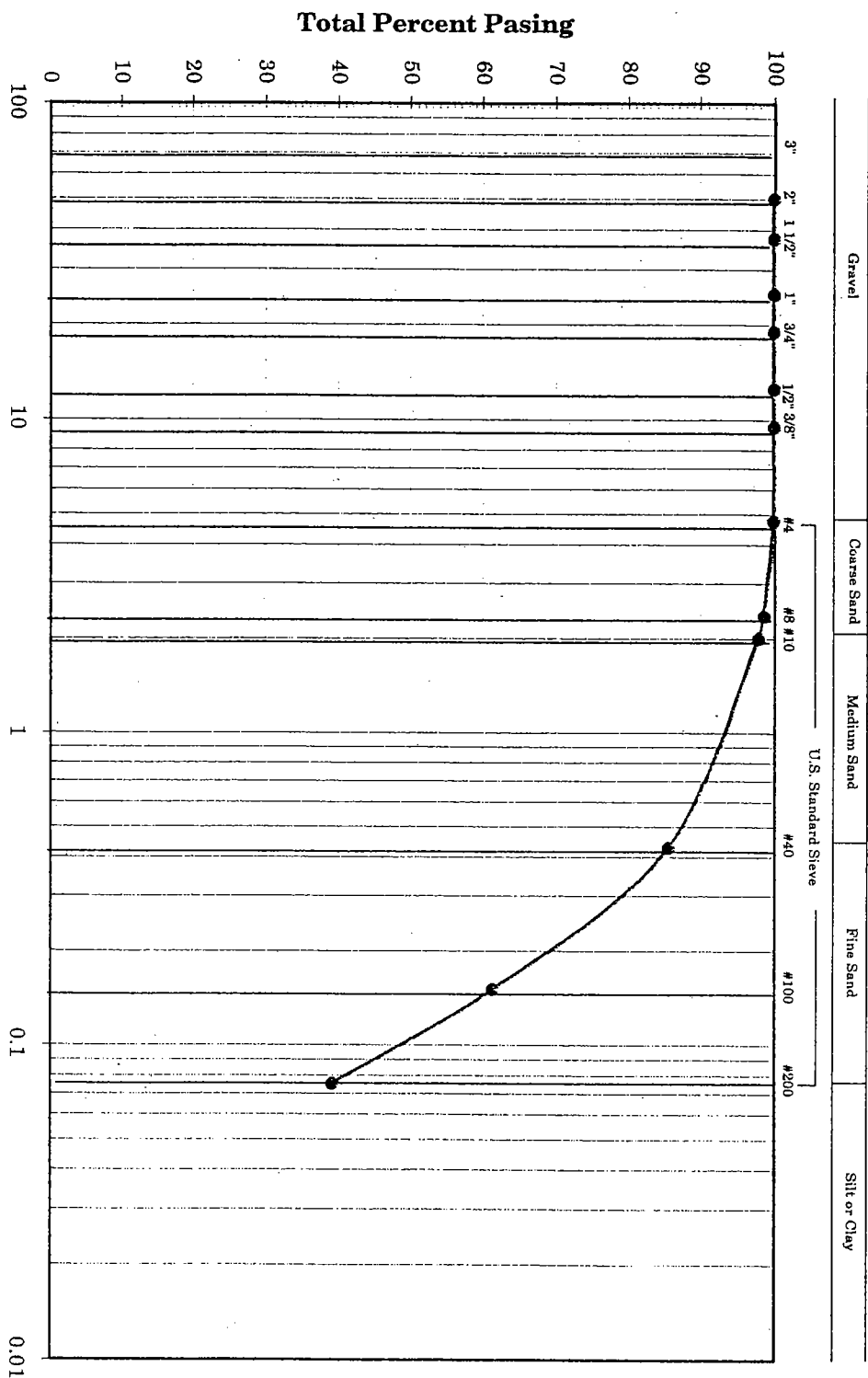
Avenue K Transmission Line  
Lancaster, California



**Earth Systems**  
Southern California

2/9/01

PL-05531-01



Sample Location: Boring 17@5'

Sample Description: Silty Fine to Medium Sand (SM)

Grain Diameter (millimeters)

**SIEVE ANALYSIS**

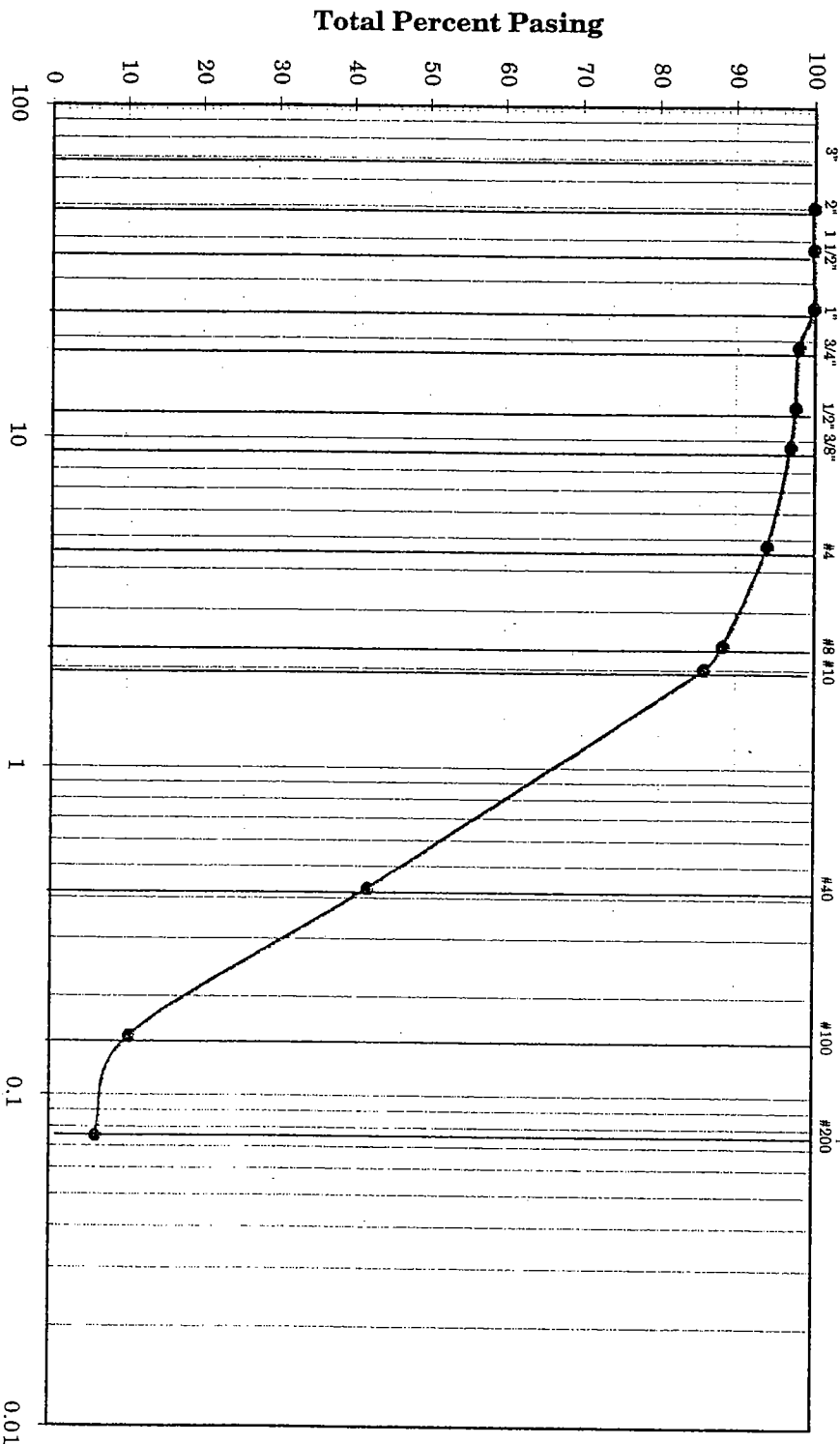
Avenue K Transmission Line  
Lancaster, California

 **Earth Systems**  
**Southern California**

2/9/01


PL-05631-01

Gravel	Coarse Sand	Medium Sand	Fine Sand	Silt or Clay
--------	-------------	-------------	-----------	--------------

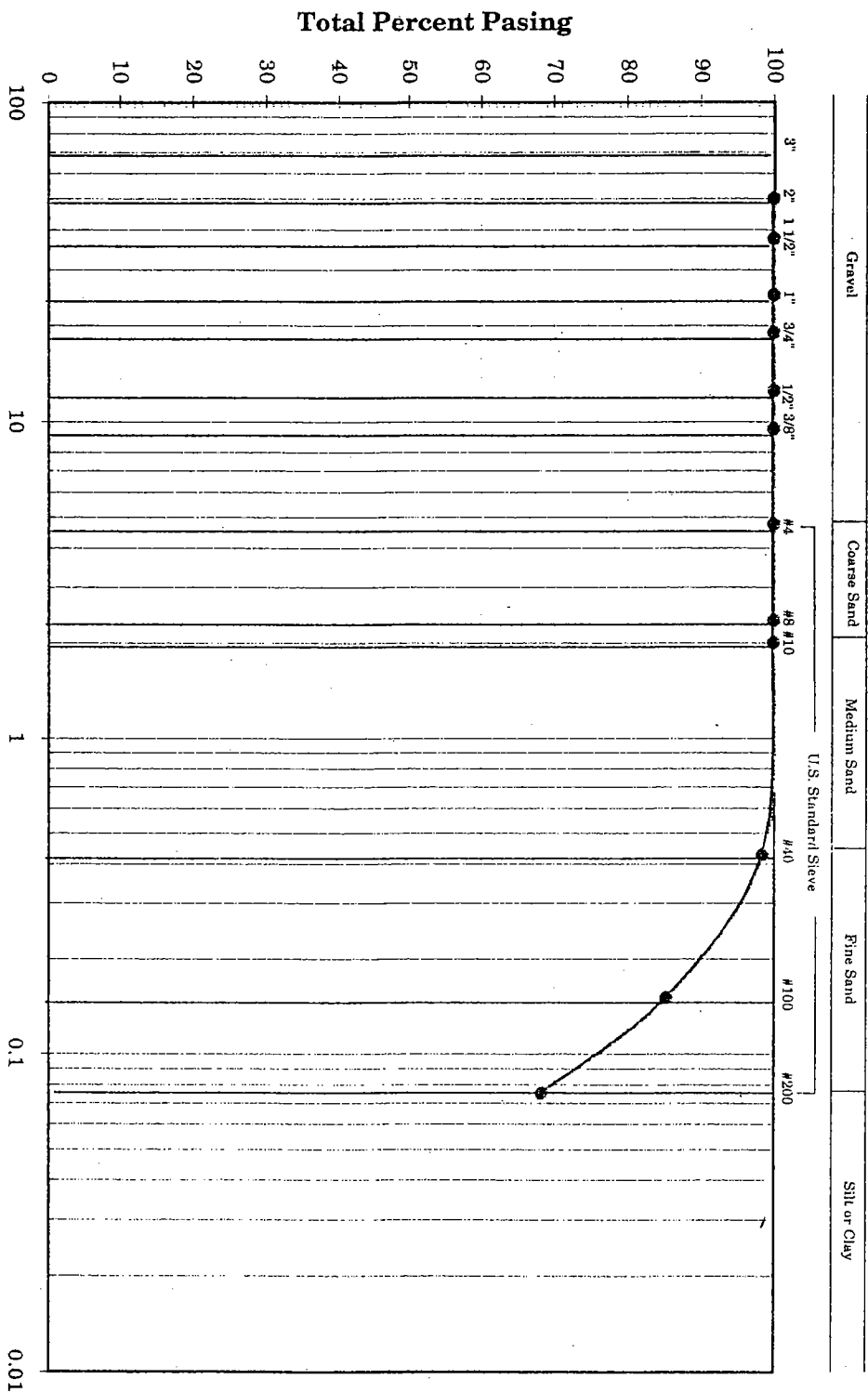


Grain Diameter (millimeters)

Sample Location: Boring 20@5'  
Sample Description: Slightly Silty Fine to Coarse Sand (SP)

<b>SIEVE ANALYSIS</b>	
Avenue K Transmission Line	
Lancaster, California	
 <b>Earth Systems</b> <b>Southern California</b>	
2/9/01	PL-05531-01





Grain Diameter (millimeters)

Sample Location: Boring 21@2'

Sample Description: Fine Sandy Clay with Silt (CL)

### SIEVE ANALYSIS

Avenue K Transmission Line  
Lancaster, California



**Earth Systems**  
**Southern California**

2/9/01

PL-05531-01

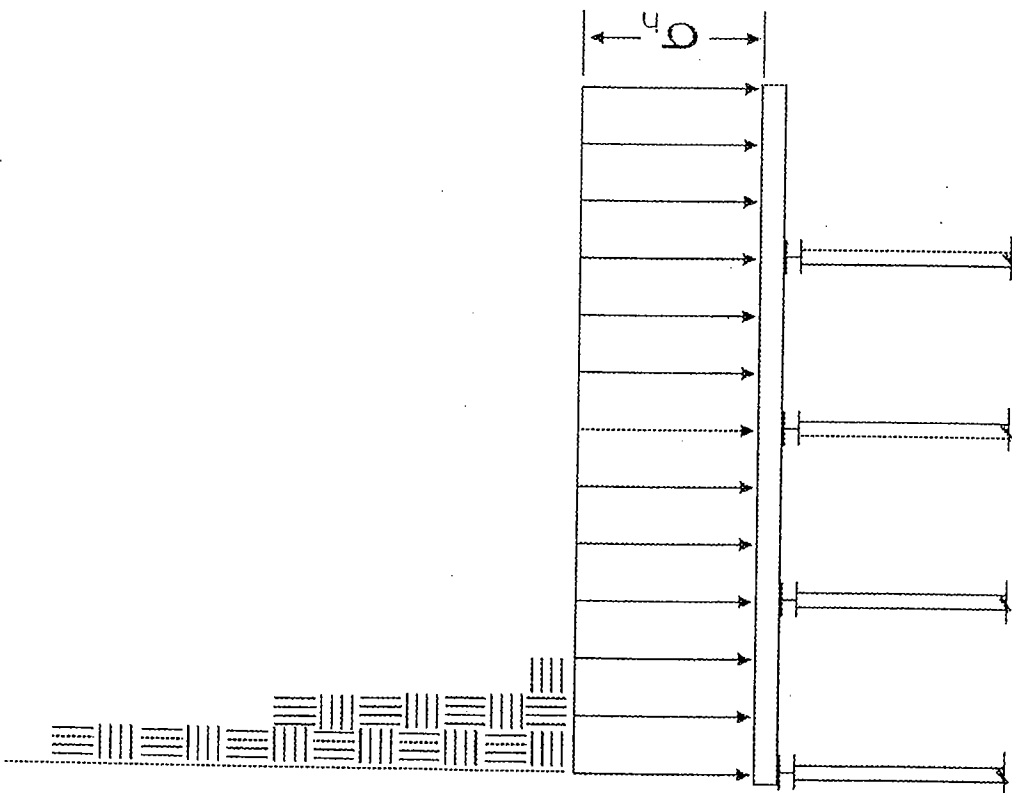
February 9, 2001

PL-05531-01

## APPENDIX C

Design Plates

EARTH SYSTEMS SOUTHERN CALIFORNIA



$$\sigma_h \text{ (ksf)} = 0.039 H$$

Notes:

- 1)  $\sigma_h$  = horizontal earth pressure acting on temporary internally braced flexible wall, H = total depth of excavation (ft).
- 2) The above analysis was based on the assumption that the wall is a yielding, flexible wall. Factors of Safety were not incorporated into the above analysis.
- 3) No heavy equipment loads or surcharge loads should be allowed within a horizontal distance measured from the top of the excavation slope, equal to the depth of the excavation.
- 4) Braces may be either long raking braces or relatively short horizontal cross braces between trench walls.

PLATE C-1

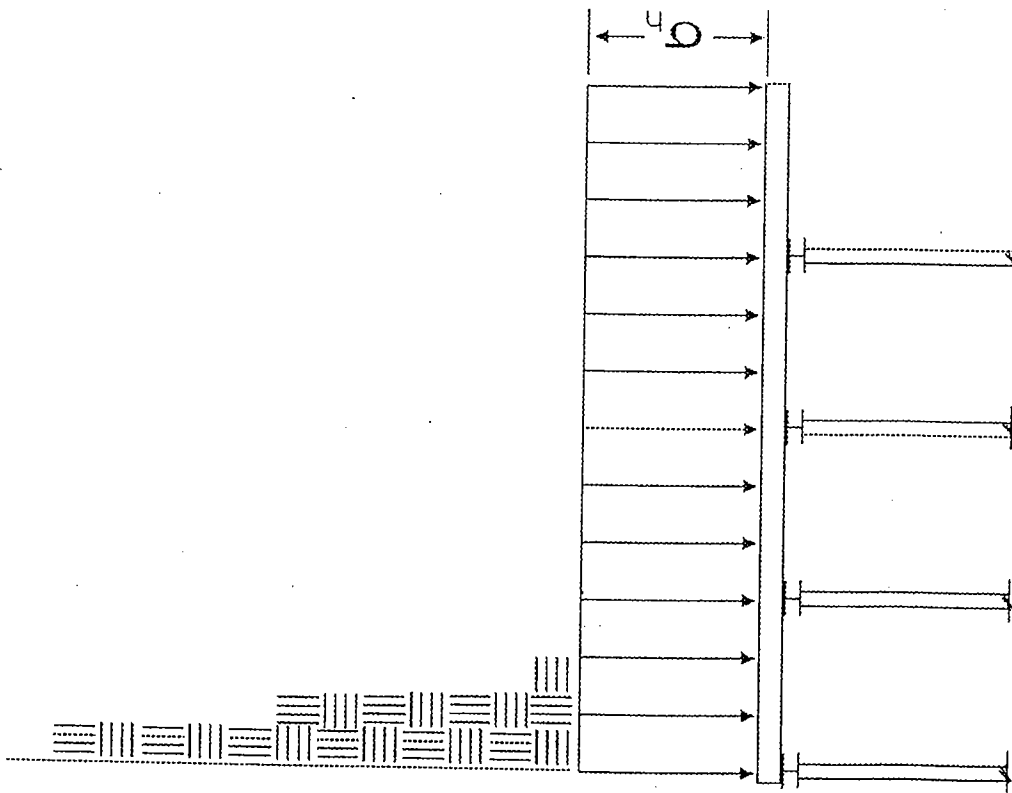
Avenue K Transmission Line - Phase I  
Lancaster, California

**Earth Systems**  
**Southern California**



02/09/2001

PL-05531-01



$$\sigma_h \text{ (ksf)} = 0.029 H$$

Notes:

- 1)  $\sigma_h$  = horizontal earth pressure acting on temporary internally braced flexible wall, H = total depth of excavation (ft).
- 2) The above analysis was based on the assumption that the wall is a yielding, flexible wall. Factors of Safety were not incorporated into the above analysis.
- 3) No heavy equipment loads or surcharge loads should be allowed within a horizontal distance measured from the top of the excavation slope, equal to the depth of the excavation.
- 4) Braces may be either long raking braces or relatively short horizontal cross braces between trench walls.

PLATE C-II

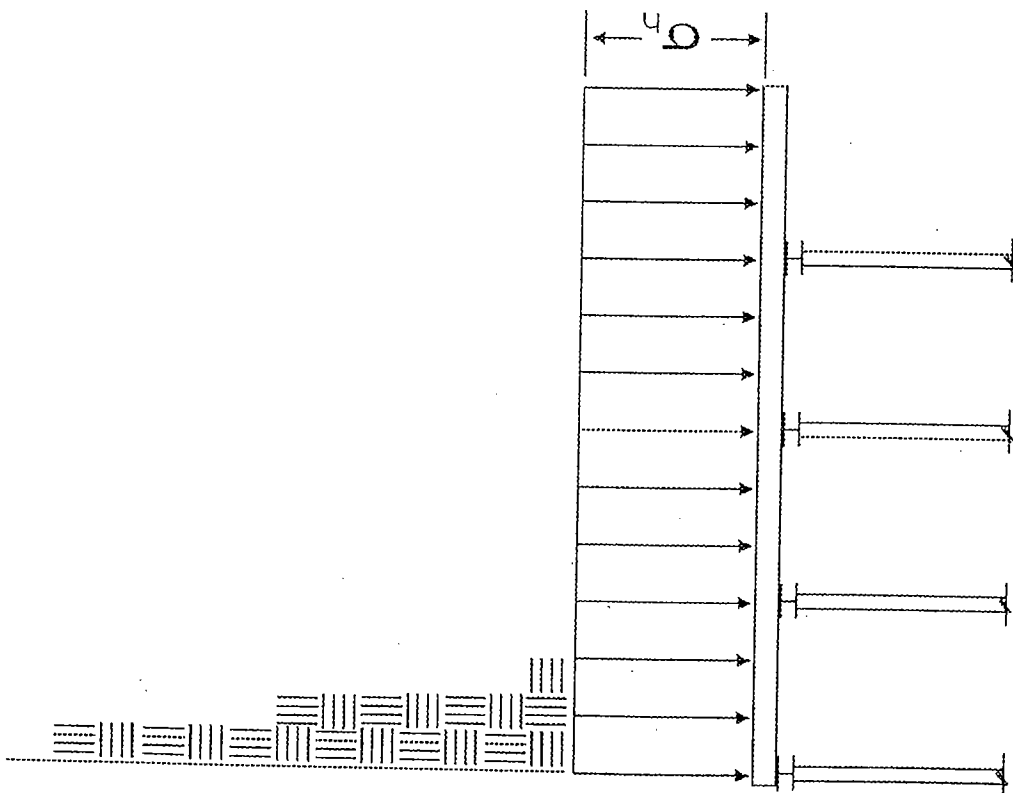
Avenue K Transmission Line - Phase II  
Lancaster, California

**Earth Systems**  
**Southern California**



02/09/2001

PL-05531-01



$$\sigma_h \text{ (ksf)} = 0.029 H$$

Notes:

- 1)  $\sigma_h$  = horizontal earth pressure acting on temporary internally braced flexible wall, H = total depth of excavation (ft).
- 2) The above analysis was based on the assumption that the wall is a yielding, flexible wall. Factors of Safety were not incorporated into the above analysis.
- 3) No heavy equipment loads or surcharge loads should be allowed within a horizontal distance measured from the top of the excavation slope, equal to the depth of the excavation.
- 4) Braces may be either long raking braces or relatively short horizontal cross braces between trench walls.

PLATE C-III

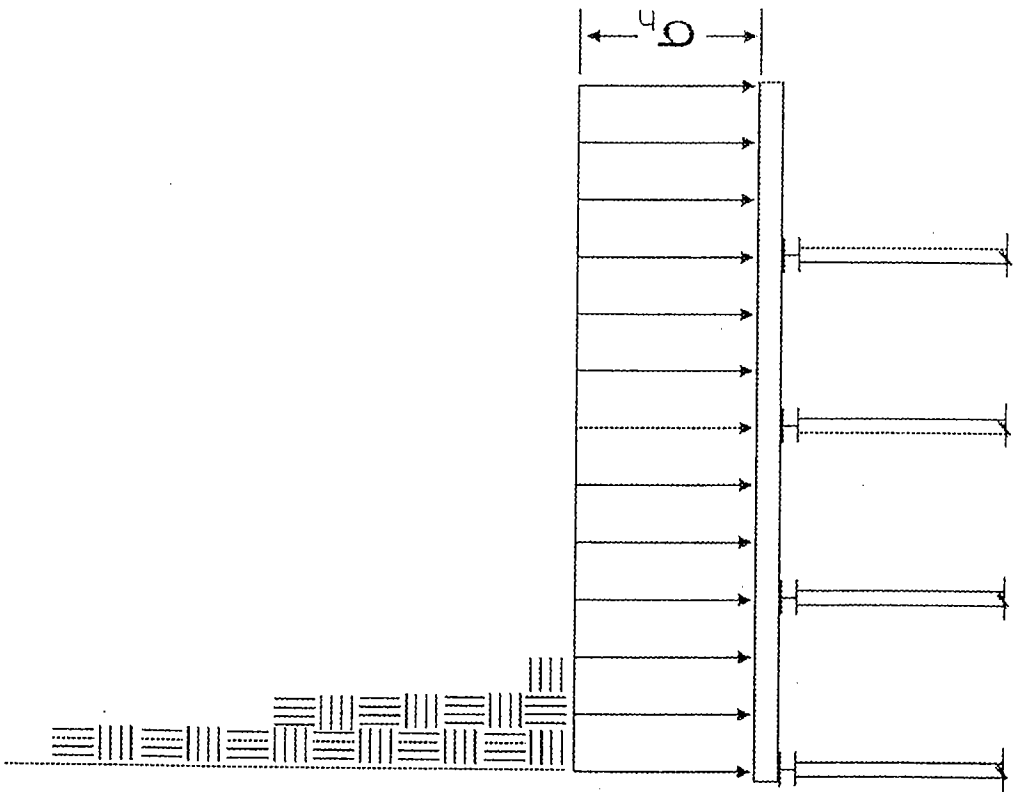
Avenue K Transmission Line - Phase III  
Lancaster, California

**Earth Systems**  
Southern California



02/09/2001

PL-05531-01



$$\sigma_h \text{ (ksf)} = 0.025 H$$

Notes:

- 1)  $\sigma_h$  = horizontal earth pressure acting on temporary internally braced flexible wall, H = total depth of excavation (ft).
- 2) The above analysis was based on the assumption that the wall is a yielding, flexible wall. Factors of Safety were not incorporated into the above analysis.
- 3) No heavy equipment loads or surcharge loads should be allowed within a horizontal distance measured from the top of the excavation slope, equal to the depth of the excavation.
- 4) Braces may be either long raking braces or relatively short horizontal cross braces between trench walls.

PLATE C-IV

APPENDIX D  
Soil Corrosivity Study

February 12, 2001

**EARTH SYSTEMS**

1024 West Avenue M-4

Palmdale, California 93551

Attention: Mr. Bruce A. Hick

Re:

Soil Corrosivity Study

Avenue K Transmission Line

Lancaster, California

Your # PL-05531-01; MJS&A #01-0081HQ

## INTRODUCTION

Laboratory tests have been completed on ten soil samples we selected from your boring logs from the route of the Avenue K Transmission Pipeline in Lancaster, California. The purpose of these tests was to determine soil corrosivity regarding the proposed steel waterline and concrete structures.

The proposed 36-inch diameter waterline will run about 31,900 feet in Avenue K, from 30<sup>th</sup> Street West to 30<sup>th</sup> Street East. The new pipeline will be installed in four phases and will have approximately five feet of cover. The water table is more than 70 feet below grade.

The scope of this study is limited to a determination of soil corrosivity and general corrosion control recommendations for materials planned for construction. If the engineers desire more specific information, designs, specifications, or review of design, we will be happy to work with them as a separate phase of this project.

## TEST PROCEDURES

The electrical resistivity of each sample was measured in a soil box per ASTM G57 in its as-received condition and again after saturation with distilled water. Resistivities are at about their lowest value when the soil is saturated. The pH of the saturated samples was measured. 5:1 water: soil extract from each sample was chemically analyzed for the major soluble salts commonly found in soils and for ammonium and nitrate. Test results are shown on Table 1.



## SOIL CORROSIVITY

A major factor in determining soil corrosivity is electrical resistivity. The electrical resistivity of a soil is a measure of its resistance to the flow of electrical current. Corrosion of buried metal is an electrochemical process in which the amount of metal loss due to corrosion is directly proportional to the flow of electrical current (DC) from the metal into the soil. Corrosion currents, following Ohm's Law, are inversely proportional to soil resistivity. Lower electrical resistivities result from higher moisture and chemical contents and indicate corrosive soil.

A correlation between electrical resistivity and corrosivity toward ferrous metals is:

Soil Resistivity in ohm-centimeters		Corrosivity Category
over	10,000	mildly corrosive
2,000 to	10,000	moderately corrosive
1,000 to	2,000	corrosive
below	1,000	severely corrosive

Other soil characteristics that may influence corrosivity towards metals are pH, chemical content, soil types, aeration, anaerobic conditions, and site drainage.

Electrical resistivities were in the mildly corrosive category with as-received moisture. When saturated, the resistivities were in moderately corrosive, corrosive and severely corrosive categories.

Soil pH values varied from 7.4 to 8.6. This range is mildly to strongly alkaline and does not particularly increase soil corrosivity.

The soluble salt content of the samples was moderate at boring 30 and low in the other borings. No concentration was high enough to be of particular concern.

The nitrate concentration was high enough to be corrosive to copper.

Tests were not made for sulfide and negative oxidation-reduction (redox) potential because these samples did not exhibit characteristics typically associated with these conditions.

This soil is classified as severely corrosive to ferrous metals, aggressive to copper, and sulfate attack on concrete as negligible.

## CONCLUSIONS

Steel pipeline should have a dielectric coating and cathodic protection, or as an alternative, it should have a cement mortar coating. In either case, the pipeline should have welded or bonded joints, insulated joints where connecting to metallic piping and structures, and test stations for corrosion monitoring.

### **RECOMMENDATIONS FOR STEEL PIPELINE WITH DIELECTRIC COATING**

1. Steel pipe should be coated with coal tar enamel per AWWA C203, fusion-bonded epoxy per AWWA C213, a tape wrap per AWWA 214, or extruded polyethylene per AWWA C215.
2. Buried steel and iron pipe, fittings, and valves in appurtenances, such as air valves and blowoffs, should be coated with a material listed above or with coal tar epoxy, wax tape, moldable sealant, or equivalent. If copper is used, electrically insulate it from the steel with an insulating joint or with a dielectric coating.
3. Prevent steel pipe from contacting concrete and/or reinforcing steel, such as at thrust blocks and wall penetrations, with such items as plastic sleeves, rubber seals, or 20 mil plastic tape.
4. Bond pipe joints for electrical continuity by means of three steel bond rods welded between the bell and the spigot.
5. Install insulated joints at all connections to existing metallic piping. Insulated joints should be placed above grade or in vaults where possible. Install an insulated joint test station at all buried or otherwise inaccessible insulated joints.
6. Install corrosion monitoring test stations at each end of the pipeline, where cathodically protected lines cross, at one end of any casings, and other locations as necessary so the interval between test stations does not exceed 1,500 feet. Pipeline test stations should use a #12 and #8 or larger wire with type THWN insulation. Independently weld each wire to the pipe. For test stations at casings, weld two additional wires of a different size, for identification, to the casing.
7. Install cathodic protection.
8. Preliminary construction drawings should be reviewed by a qualified corrosion engineer to insure that corrosion control is properly designed.
9. The pipeline should be tested to insure that the joint bonds, insulated joints, and test stations are effective after the pipeline is backfilled, but before the construction contract is completed. Also, native or baseline pipe-to-soil potentials should be measured and recorded. These data will be useful in determining if pipeline conditions change in the future. Test the cathodic protection system.
10. Pipe-to-soil potentials should be measured annually to confirm that cathodic protection is adequate.

### **RECOMMENDATIONS FOR STEEL PIPELINE WITH CEMENT-MORTAR COATING**

1. Steel pipe with a cement-mortar coating per AWWA Standard C-205 requires no additional protection. Any type of cement may be used.
2. Buried steel and iron pipe and fittings in appurtenances such as air valves and blowoffs should be cement-mortar coated or concrete or cement slurry encased where possible. Otherwise, they should be coated with wax tape after assembly.
3. Bond pipe joints for electrical continuity by means of two steel bonding clips welded between the bell and the spigot and coated with cement-mortar.

4. Install insulated joints at all connections to existing metallic piping. Insulated joints should be placed above grade or in vaults where possible. Install an insulated joint type test station at all buried or otherwise inaccessible insulated joints.
5. Install corrosion monitoring test stations at each end of the pipeline, at one end of any casings, where any cathodic protected lines cross and other locations as necessary so the interval between test stations does not exceed 1,500 feet. Pipeline test stations should use a #12 and #6 or larger wire with type THWN insulation. Independently weld each wire to the pipe. For test stations at casings, weld two additional wires of a different size, for identification, to the casing.
6. To insure that corrosion control is properly designed, a qualified corrosion engineer should review preliminary construction drawings.
7. After the pipeline is backfilled, but before the construction contract is completed, the pipeline should be tested to insure that the joint bonds, insulating joints, and test stations are effective. Also, native pipe-to-soil potentials should be measured and recorded. These data will be useful in determining if pipeline conditions change in the future.
8. Pipe-to-soil potentials should be measured biannually to determine if conditions on the pipeline are changing.

#### RECOMMENDATIONS FOR CONCRETE STRUCTURES

1. Any type of cement may be used for concrete structures and pipe because the sulfate concentration is negligible, 0 to 0.1 percent, per 1997 Uniform Building Code (UBC) Table 19-A-4 and American Concrete Institute (ACI-318) Table 4.3.1.
3. Standard concrete cover over reinforcing steel may be used for concrete structures and pipe in contact with these soils.

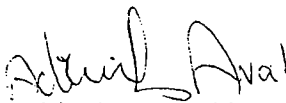
#### CLOSURE

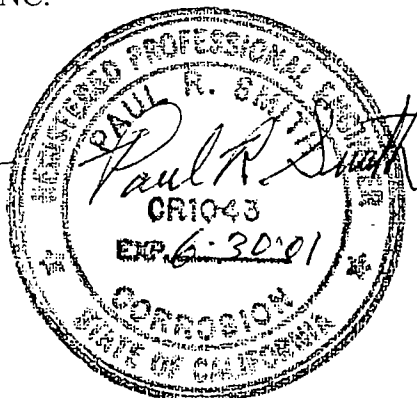
Our services have been performed with the usual thoroughness and competence of the engineering profession. No other warranty or representation, either expressed or implied, is included or intended.

Please call if you have any questions.

Respectfully Submitted,  
M.J. SCHIFF & ASSOCIATES, INC.

Reviewed by,

  
Adrineh A. Avakian  
Enc.: Table 1




  
Paul R. Smith, P.E.

Table 1 - Laboratory Tests on Soil Samples

Ave K transmission Line, Lancaster, CA  
 Your #PL-05531-01, MJS&A #01-0081HQ  
 2-Feb-01

Sample ID			3	5	7	11	17
			@ 0-5'	@ 0-5'	@ 0-5'	@ 0-5'	@ 0-5'
			ML	SM	ML	SM/ML	SM
Resistivity	Units						
as-received	ohm-cm		1,700,000	1,500,000	1,400,000	2,050,000	1,350,000
saturated	ohm-cm		6,900	3,050	5,500	6,500	6,550
pH			7.4	7.6	8.0	8.3	8.1
Electrical							
Conductivity	mS/cm		0.06	0.09	0.09	0.08	0.07
Chemical Analyses							
Cations							
calcium	Ca <sup>2+</sup>	mg/kg	48	44	56	52	68
magnesium	Mg <sup>2+</sup>	mg/kg	10	19	12	19	7
sodium	Na <sup>1+</sup>	mg/kg	ND	ND	ND	ND	ND
Anions							
carbonate	CO <sub>3</sub> <sup>2-</sup>	mg/kg	ND	ND	ND	ND	ND
bicarbonate	HCO <sub>3</sub> <sup>1-</sup>	mg/kg	58	76	168	146	180
chloride	Cl <sup>1-</sup>	mg/kg	ND	14	11	11	11
sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/kg	ND	ND	ND	ND	ND
Other Tests							
ammonium	NH <sub>4</sub> <sup>1+</sup>	mg/kg	3.0	1.8	2.7	2.8	1.9
nitrate	NO <sub>3</sub> <sup>1-</sup>	mg/kg	2.9	62.7	4.2	1.6	2.4
sulfide	S <sup>2-</sup>	qual	na	na	na	na	na
Redox	mv		na	na	na	na	na

Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.

mg/kg = milligrams per kilogram (parts per million) of dry soil.

Redox = oxidation-reduction potential in millivolts

ND = not detected

na = not analyzed

Table 1 - Laboratory Tests on Soil Samples

Ave K transmission Line, Lancaster, CA

Your #PL-05531-01, MJS&amp;A #01-0081HQ

2-Feb-01

Sample ID			21	27	28	30	32
			@ 0-5'	@ 0-5'	@ 0-5'	@ 0-5'	@ 0-5'
			CL/SM	ML/SM	CL	CL/SM	CL/SM
<b>Resistivity</b>							
	<b>Units</b>						
as-received	ohm-cm		920,000	2,200,000	2,100,000	250,000	2,000,000
saturated	ohm-cm		3,200	3,000	3,500	790	1,950
<b>pH</b>			8.6	8.6	8.1	8.4	8.0
<b>Electrical</b>							
Conductivity	mS/cm		0.12	0.13	0.11	0.44	0.18
<b>Chemical Analyses</b>							
<b>Cations</b>							
calcium	Ca <sup>2+</sup>	mg/kg	20	88	92	68	112
magnesium	Mg <sup>2+</sup>	mg/kg	7	10	15	12	15
sodium	Na <sup>1+</sup>	mg/kg	90	73	11	297	ND
<b>Anions</b>							
carbonate	CO <sub>3</sub> <sup>2-</sup>	mg/kg	18	6	3	42	ND
bicarbonate	HCO <sub>3</sub> <sup>1-</sup>	mg/kg	299	336	272	360	223
chloride	Cl <sup>1-</sup>	mg/kg	ND	21	11	177	25
sulfate	SO <sub>4</sub> <sup>2-</sup>	mg/kg	ND	100	69	241	112
<b>Other Tests</b>							
ammonium	NH <sub>4</sub> <sup>1+</sup>	mg/kg	2.4	2.7	1.3	1.7	2.4
nitrate	NO <sub>3</sub> <sup>1-</sup>	mg/kg	1.6	9.5	29.1	117.4	79.4
sulfide	S <sup>2-</sup>	qual	na	na	na	na	na
Redox	mv		na	na	na	na	na

Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.

mg/kg = milligrams per kilogram (parts per million) of dry soil.

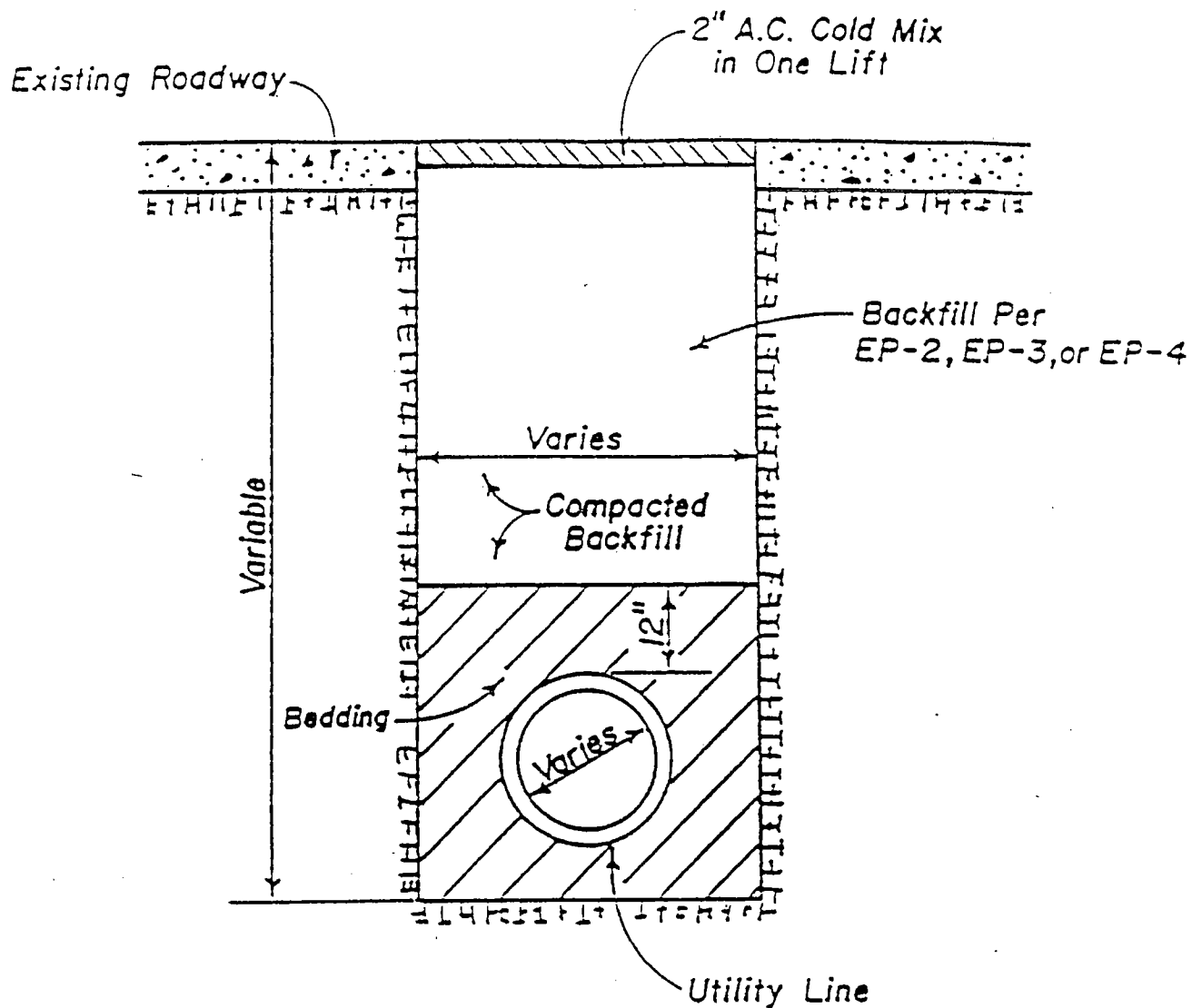
Redox = oxidation-reduction potential in millivolts

ND = not detected

na = not analyzed

**APPENDIX E**

City of Lancaster Street Repair Guidelines



Temporary A.C. Pavement shall be placed per Sec. 306-1.5.1 of the Standard Specifications for Public Works Construction.

TEMPORARY

CITY OF LANCASTER

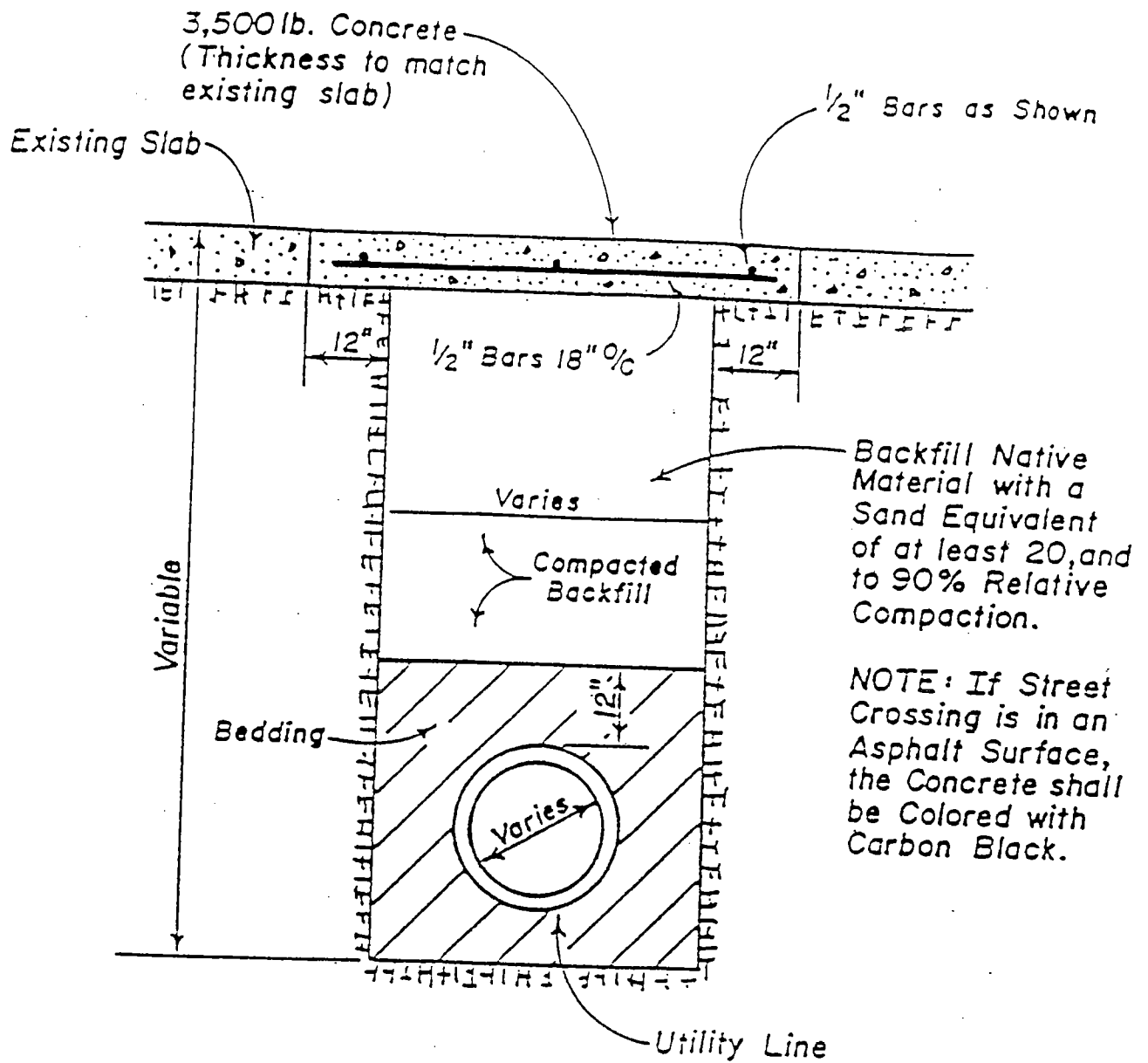
ASPHALT REPAIR (TEMPORARY)

PLAN  
EP-1

APPROVED

*Chad L. Long*  
DIRECTOR OF PUBLIC WORKS

16 Dec 88  
DATE



Compaction Shall be Certified

**SPECIAL NOTICE:**

If the Trench has been Excavated Closer than 12" to the Sawed Edge of the Street, the Concrete Shall be Resawed to provide 12" of Undisturbed Earth Prior to Paving.

**CITY OF LANCASTER**

**PERMANENT REPAIR OF  
EXISTING STREETS AND ALLEYS**

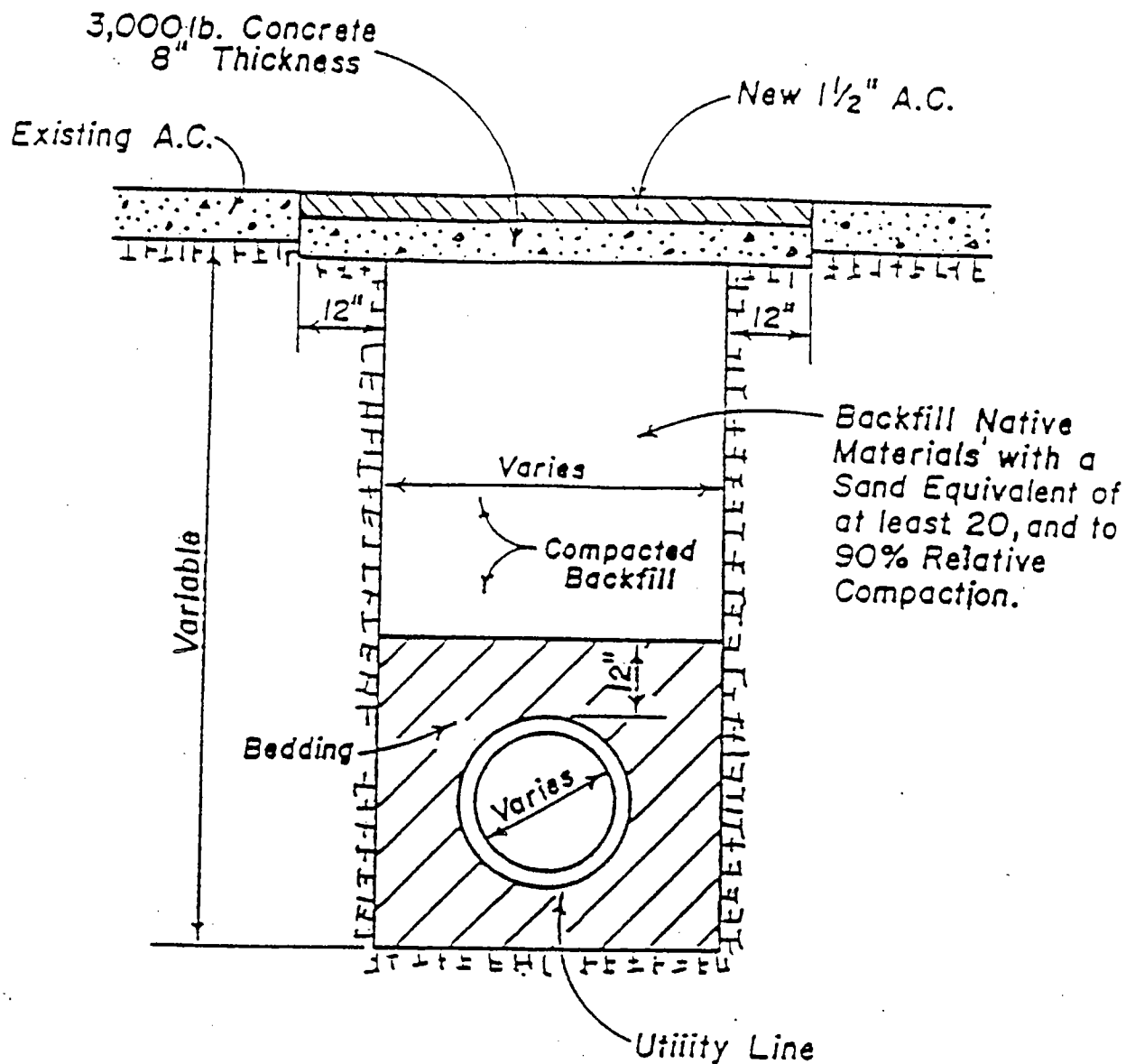
APPROVED

*Jeff L. Long*  
DIRECTOR OF PUBLIC WORKS

*16 Dec 88*  
DATE

PLAN  
EP-2





CONCRETE OPTION #1

CITY OF LANCASTER

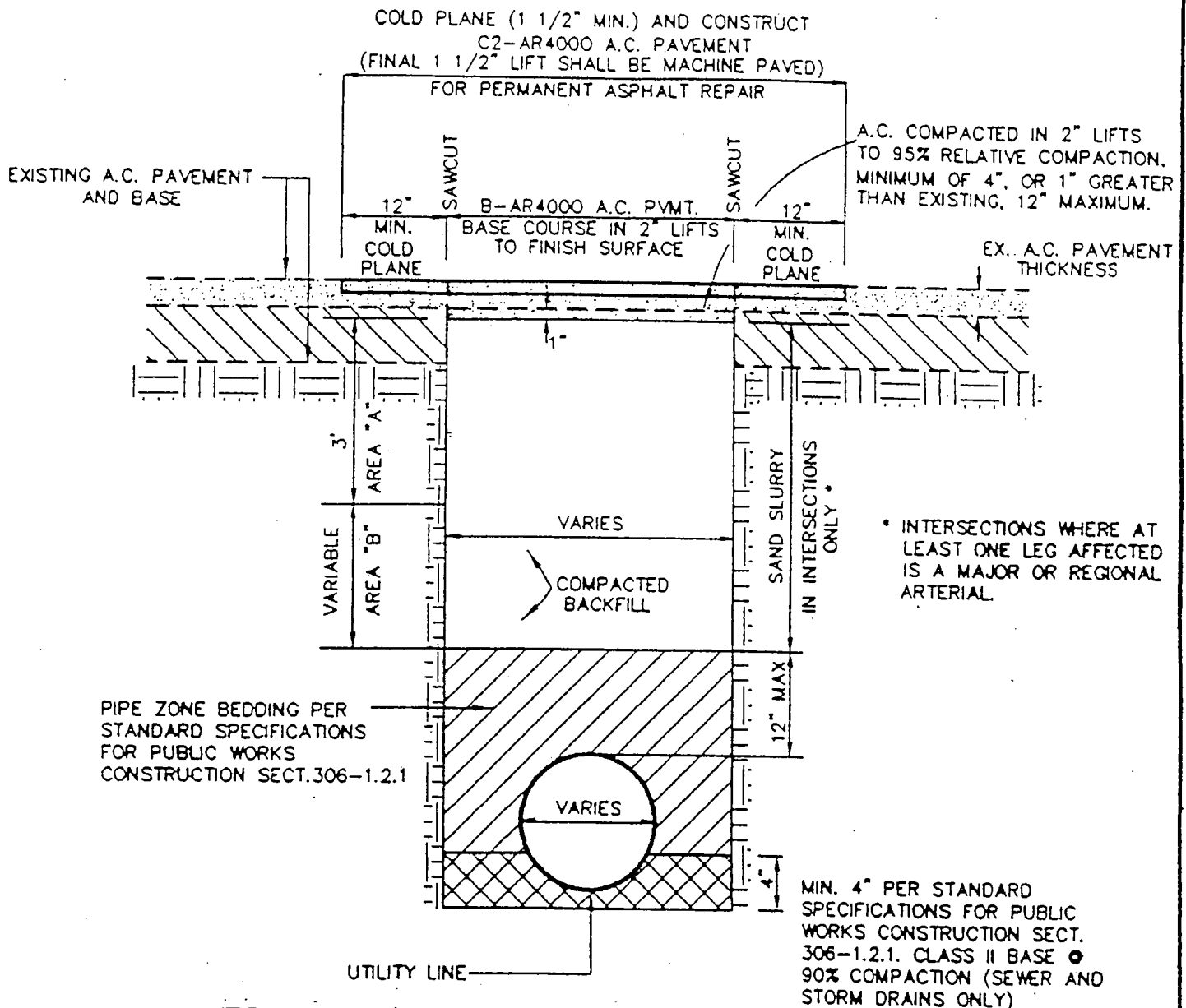
PERMANENT REPAIR OF  
EXISTING STREETS AND ALLEYS

PLAN  
EP-3

APPROVED

*[Signature]*  
DIRECTOR OF PUBLIC WORKS

*16 Dec 94*  
DATE



AREA "A"- BACKFILL SHALL BE 1 1/2 SACK SAND SLURRY (NO CERTIFICATION REQUIRED), OR CRUSHED AGGREGATE BASE. IF CRUSHED AGGREGATE BASE IS USED IT SHALL BE MECHANICALLY COMPACTED TO 95% RELATIVE COMPACTION AND BE CERTIFIED. (SEE "\*" NOTE FOR INTERSECTIONS).

AREA "B"- BACKFILL NATIVE OR IMPORT MATERIAL WITH A SAND EQUIVALENT OF AT LEAST 20, MECHANICALLY COMPACTED TO 90% RELATIVE COMPACTION. (SEE "\*" NOTE FOR INTERSECTIONS).

PLAN  
EP-4

REVISION DATE: MARCH 18, 1998

SUBMITTED

CITY ENGINEER

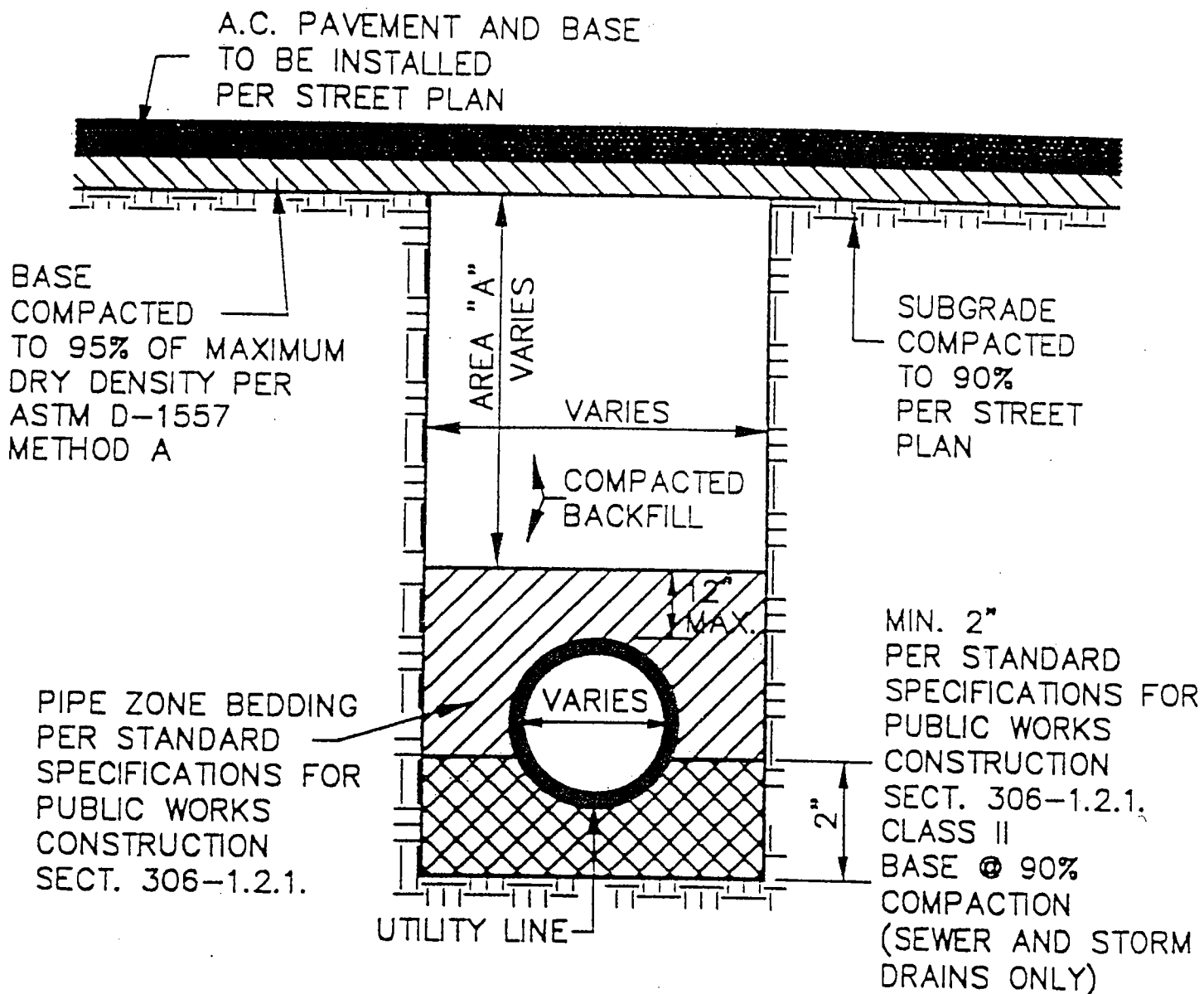
DATE

APPROVED

DIRECTOR OF PUBLIC WORKS DATE

CITY OF LANCASTER  
DEPARTMENT OF PUBLIC WORKS

CONSTRUCTION OF UTILITY TRENCHES  
IN EXISTING STREETS AND ALLEYS



AREA "A" - SUITABLE BACKFILL NATIVE MATERIAL, AS PER STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION SECT. 306-1.2.1., TO 90% RELATIVE COMPACTION OF THE MAXIMUM DRY DENSITY, PER ASTM D-1557, METHOD A.

PLAN  
EP-5

4-8-92

SUBMITTED

*[Signature]* 11-14-96  
DATE

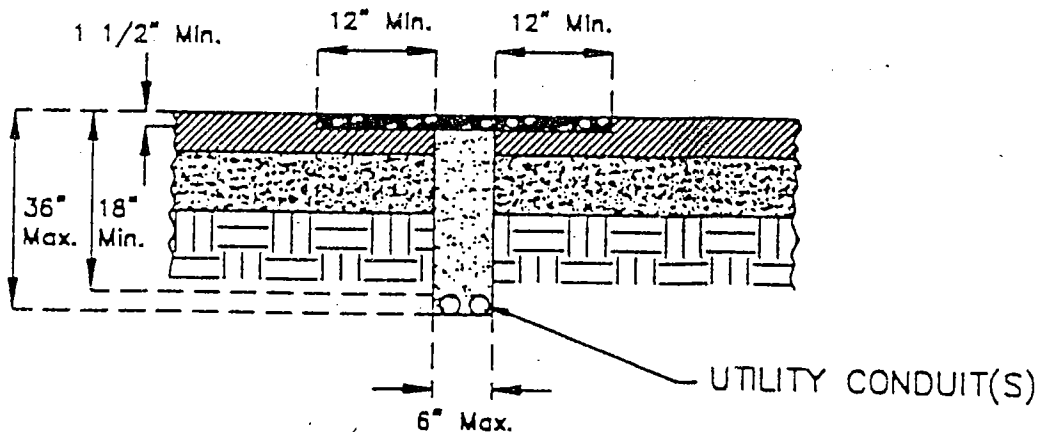
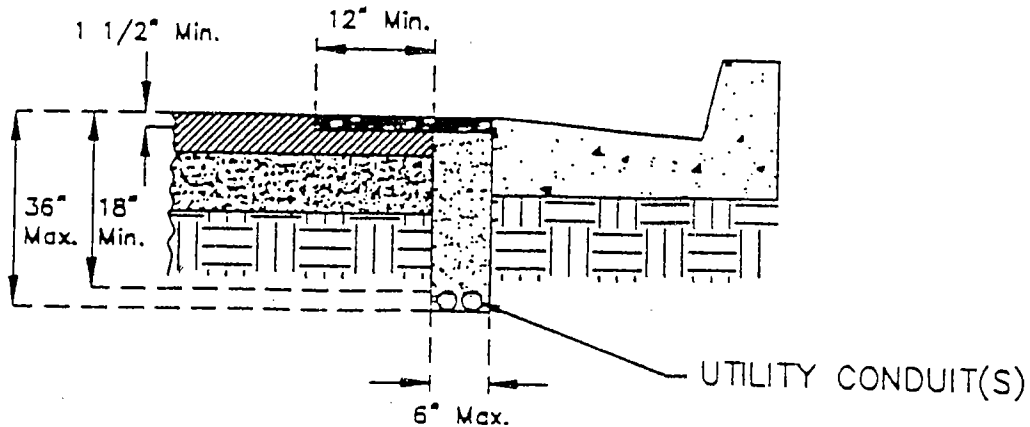
CITY OF LANCASTER  
DEPARTMENT OF PUBLIC WORKS





APPROVED

*[Signature]* 11/14/96  
DIRECTOR OF PUBLIC WORKS DATE

CONSTRUCTION OF UTILITY TRENCHES  
PRIOR TO STREET CONSTRUCTION

Remove AC pavement to a depth of 1 1/2" by cold planing. Place and compact 1 1/2" AC pavement (C2-AR4000) per the City of Lancaster Street Opening and Pavement Restoration Regulations.



-  New AC Pavement
-  Existing AC Pavement
-  Existing Crushed Aggregate Base
-  1 1/2 Sack PCC Sand Slurry

PLAN  
EP-6

SUBMITTED

CITY ENGINEER

DATE

CITY OF LANCASTER  
DEPARTMENT OF PUBLIC WORKS

APPROVED

DIRECTOR OF PUBLIC WORKS

DATE

PAVEMENT RESTORATION OF ROCK-WHEEL  
TRENCHES IN EXISTING STREETS AND ALLEYS

# EXHIBIT G

DRAFT NEGATIVE DECLARATION

MAILING LIST

**AVENUE K TRANSMISSION WATER MAIN**  
**NEGATIVE DECLARATION**  
**MAILING LIST**  
**10/23/08**

---

Mr. Russell Fuller  
General Manager  
Antelope Valley East-Kern Water Agency  
P.O. Box 3176  
Quartz Hill, California 93534

Mr. Stefan Cajina  
California Department of Public Health  
1449 West Temple Street  
Los Angeles, CA 90026-5698

Mr. Mack Hakakian  
Lahontan Regional  
Water Quality Control Board  
14440 Civic Drive, Suite 200  
Victorville, CA 92392  
(760) 241-6583

Mr. Asoka Herath  
Director of Planning  
City of Palmdale  
38306 9th Street  
Palmdale, CA 93550  
(661) 267-5200

Mr. Leon Swain  
Director of Public Works  
City of Palmdale  
38300 North Sierra Highway  
Palmdale, CA 93550

Mr. James R. Williams  
Director of Public Works  
City of Lancaster  
44933 North Fern Avenue  
Lancaster, CA 93534

Mr. Brian S. Ludicke  
Director of Planning  
City of Lancaster  
44933 North Fern Avenue  
Lancaster, CA 93534

Mr. Bruce McClendon  
Director of Regional Planning  
County of Los Angeles  
320 West Temple Street  
Los Angeles, CA 90012  
(213) 974-6401

Ms. Fannie Love  
Community Library Manager  
Lancaster Regional Library  
601 West Lancaster Boulevard  
Lancaster, CA 93534

Ms. Nancy Quelland  
Library Director  
Palmdale City Library  
700 East Palmdale Boulevard  
Palmdale, CA 93550  
(661) 267-5600

Ms. Terry Roberts  
State of California  
Office of Research and Planning  
State Clearing House  
1400 10th Street, Room 121  
Sacramento, CA 95814

---

## EXHIBIT H

### RESPONSES TO REVIEW COMMENTS



# COUNTY OF LOS ANGELES

## DEPARTMENT OF PUBLIC WORKS

*"To Enrich Lives Through Effective and Caring Service"*

DEAN D. EFSTATHIOU, Acting Director

900 SOUTH FREMONT AVENUE  
ALHAMBRA, CALIFORNIA 91803-1331  
Telephone: (626) 458-5100  
<http://dpw.lacounty.gov>

ADDRESS ALL CORRESPONDENCE TO:  
P.O. BOX 1460  
ALHAMBRA, CALIFORNIA 91802-1460

March 26, 2008

IN REPLY PLEASE

REFER TO FILE: **WW-2**

Ms. Nancy Dagle  
California Department of Public Health  
P.O. Box 997377  
Sacramento, CA 95899-7377

Dear Ms. Hagle:

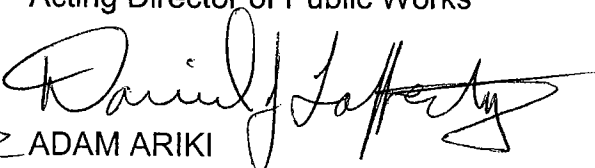
**LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 40, ANTELOPE VALLEY  
REGION NO. 04, LANCASTER  
AVENUE K TRANSMISSION WATER MAIN, PHASES I-IV  
NEGATIVE DECLARATION  
RESPONSE TO COMMENTS**

Thank you for your comments to our Initial Study and Negative Declaration for the proposed Avenue K Transmission Water Main project. Per your recommendation, we have discussed our project scope with Mr. Stefan Cajina of your agency. Mr. Cajina concurred with our determination that the proposed project will not increase the water supply, storage or treatment of our drinking water system and that, therefore, no permit amendment is required.

If you have any further questions or require additional information, please contact Mr. Michael Ignatius at (626) 300-3396 or at [mignatiu@dpw.lacounty.gov](mailto:mignatiu@dpw.lacounty.gov).

Very truly yours,

DEAN D. EFSTATHIOU  
Acting Director of Public Works

*FOR*   
ADAM ARIKI  
Assistant Deputy Director  
Waterworks Division

MI:dv

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MARK B HORTON, MD, MSPH  
Director

State of California—Health and Human Services Agency  
California Department of Public Health



ARNOLD SCHWARZENEGGER  
Governor

December 11, 2007

Mr. Michael Ignatius  
Los Angeles County Waterworks  
District 40, Antelope Valley  
P.O. Box 1460  
Alhambra, CA 91802-1460

Dear Mr. Ignatius:

RE: Proposed Negative Declaration for Avenue K Transmission Main, Phases I-IV

Thank you for the opportunity to review the above document. The California Department of Public Health (CDPH), Division of Drinking Water and Environmental Management is responsible for issuing water supply permits administered under the Safe Drinking Water Program and may need to issue a new or amended Water supply Permit for the above referenced project. A project triggers a permit if it includes increases in water supply, storage or treatment of drinking water. CDPH will be a responsible agency pursuant to the California Environmental Quality Act (CEQA) and considers the above referenced document as adequate to meet the CDPH CEQA permit requirements.

Please contact the CDPH local district office at (213) 580-5723. If you need assistance with the CDPH requirement for permit application, contact Mr. Stefan Cajina, PE with any questions.

Sincerely,

Nancy Dagle  
Environmental Scientist  
CDPH Environmental Review Unit

Cc:  
Project File  
Stefan Cajina



# COUNTY OF LOS ANGELES

## DEPARTMENT OF PUBLIC WORKS

*"To Enrich Lives Through Effective and Caring Service"*

DEAN D. EFSTATHIOU, Acting Director

900 SOUTH FREMONT AVENUE  
ALHAMBRA, CALIFORNIA 91803-1331  
Telephone: (626) 458-5100  
<http://dpw.lacounty.gov>

ADDRESS ALL CORRESPONDENCE TO:  
P.O. BOX 1460  
ALHAMBRA, CALIFORNIA 91802-1460

April 7, 2008

IN REPLY PLEASE

REFER TO FILE: **WW-3**

Mr. Mack Hakakian, PG  
California Regional Water Quality Control Board  
Lahontan Region  
14440 Civic Drive, Suite 200  
Victorville, CA 92392

*dc: SPINDLE, READING, MI*

Dear Mr. Hakakian:

**LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 40, ANTELOPE VALLEY  
REGION 4, LANCASTER  
AVENUE K TRANSMISSION WATER MAIN, PHASES I-IV  
NEGATIVE DECLARATION  
RESPONSE TO COMMENTS**

Thank you for your comments to our Initial Study and Negative Declaration (ND) for the proposed Avenue K Transmission Water Main project. Below are our responses to your comments. We have marked the specific concerns in your letter and numbered them so we can better address them. The numbers below match the numbers in the enclosed copy of your letter.

1. The proposed project consists of installing approximately 32,000 linear feet of a 30-inch to 36-inch-diameter transmission water main below ground, along the paved right of way of Avenue K in the City of Lancaster. No alteration of drainage patterns or addition of impervious surfaces will result from the installation of this water main as the road will be restored to its original condition after construction. Therefore, the principles of Low Impact Development do not apply to this project.
2. To comply with the National Pollutant Discharge Elimination System permit requirements and upon award of the project, we will coordinate with the California Regional Water Quality Control Board, Lahontan Region, and submit a Notice of Intent, attain a wastewater discharge identification number, and submit a copy of the approved Storm Water Pollutant Prevention Plan (SWPPP). The SWPPP will include Best Management Practices (BMP) for the construction phase of the project. No post construction BMPs will be included as the road will be restored to its original condition.


Mr. Mack Hakakian  
April 7, 2008  
Page 2

3. The project does not cross nor will it impact areas of known drainages, wetlands, surface Waters of the State, Waters of the U.S. or blue-line streams. Therefore, no further measures need to be incorporated into the project.
4. See No. 3
5. See No. 2

If you have any further questions or require additional information, please contact Mr. Michael Ignatius at (626) 300-3396 or at [mignatui@dpw.lacounty.gov](mailto:mignatui@dpw.lacounty.gov).

Very truly yours,

DEAN D. EFSTATHIOU  
Acting Director of Public Works

*For*   
ADAM ARIKI  
Assistant Deputy Director  
Waterworks Division

MI:dv  
H:\WWW\HOME\DVASQUEZ\2008\_LETTERS\Backup of ND Response letter.wbk

Enc.



# California Regional Water Quality Control Board Lahontan Region



Linda S. Adams  
Secretary for  
Environmental Protection

Victorville Office  
14440 Civic Drive, Suite 200, Victorville, California 92392  
(760) 241-6583 • Fax (760) 241-7308  
<http://www.waterboards.ca.gov/lahontan>

Arnold Schwarzenegger  
Governor

December 10, 2007

File: Environmental Doc Review  
Los Angeles County

Michael Ignatius  
Los Angeles County Department of Public Works  
Waterworks Division  
Post Office Box 1460  
Alhambra, CA 91802-1460

## COMMENTS ON THE PROPOSED NEGATIVE DECLARATION FOR INSTALLING APPROXIMATELY 32,000 LINEAR FEET OF 30 TO 36 INCH-DIAMETER TRANSMISSION WATER MAIN ALONG AVENUE "K" FROM 30<sup>TH</sup> STREET EAST TO 30<sup>TH</sup> STREET WEST, IN THE CITY OF LANCASTER

California Regional Water Quality Control Board staff (Water Board) has reviewed the above referenced project proposal. Our comments are submitted in compliance with CEQA Guidelines §15096, which requires CEQA responsible agencies to specify the scope and content of the environmental information germane to their statutory responsibilities and lead agencies to include that information in the environmental document for their project. The followings are our comments in regards to the above-referenced proposed project:

- The site plan for this project does not specifically identify features for the post-construction period that will control stormwater on-site or prevent pollutants from non-point sources from entering and degrading surface or ground waters. The foremost method of reducing impacts to watersheds from urban development is "Low Impact Development" (LID), the goals of which are maintaining a landscape functionally equivalent to predevelopment hydrologic conditions and minimal generation of nonpoint source pollutants. LID results in less surface runoff and potentially less impacts to receiving waters. Principles of LID include:
  - Maintaining natural drainage paths and landscape features to slow and filter runoff and maximize groundwater recharge,
  - Reducing the impervious cover created by development and the associated transportation network, and
  - Managing runoff as close to the source as possible.

We understand that LID development practices that would maintain aquatic values could also reduce local infrastructure requirements and maintenance costs, and could benefit air quality, open space, and habitat. Planning tools to implement the above principles and manuals are available to provide specific guidance regarding LID.

We request you require these principles to be incorporated into the proposed project design. We request natural drainage patterns be maintained to the extent feasible.

*California Environmental Protection Agency*

- The project requires development of a Stormwater Pollution Prevention Plan and
  - \* A NPDES General Construction Stormwater Permit (for residential projects)
  - \* A NPDES General Industrial Stormwater Permit (for Commercial projects)These permits are accessible on the State Board's Homepage ([www.waterboards.ca.gov](http://www.waterboards.ca.gov)). Best Management Practices must be used to mitigate project impacts. The environmental document must describe the mitigation measures or Best Management Practices.
- If the proposed project crosses in areas that contain drainages, wetlands, surface Waters of the State, Waters of the U.S. or blue-line streams, we request that measures be incorporated into the project to avoid such features and provide buffer zones where possible. Please inform project proponent to consult with Army Corps of Engineers, Department of Fish and Game, and the Water Board prior to issuing a grading permit.
- If the development of the proposed project is impacting drainages, wetlands, surface Waters of the State, Waters of the U.S. or blue-line streams, a permit is required to be issued by the SWRCB or Water Board. The required permits may include:
  - Discharge of fill material - Clean Water Act (CWA) §401 water quality certification for federal waters; or Waste Discharge Requirements for non-federal waters, and
  - Land disturbance - CWA §402(p) storm water permit, to include the development of a Stormwater Pollution Prevention Plan and a NPDES General Construction Stormwater Permit and/or a NPDES General Industrial Stormwater Permit. These permits are accessible on the State Board's Homepage ([www.waterboards.ca.gov](http://www.waterboards.ca.gov)).

If the project is not subject to federal requirements, activities that involve fill or alteration of surface waters including drainage channels may still be subject to state permitting requirements. Please see information at the Regional Board web site at: [http://www.waterboards.ca.gov/lahtontan/Permitting\\_Questions.htm](http://www.waterboards.ca.gov/lahtontan/Permitting_Questions.htm) and at [http://www.waterboards.ca.gov/lahtontan/files/general\\_permits4lahtontan.pdf](http://www.waterboards.ca.gov/lahtontan/files/general_permits4lahtontan.pdf). Surface waters include, but are not limited to, drainages, streams, washes, ponds, pools or wetlands. Waters of the State or Waters of the U.S. may be permanent or intermittent. Waters of the State may include waters determined to be isolated or otherwise non-jurisdictional by the Army Corps of Engineers.

Mitigation must replace functions and values of water quality impacted. For more information see the Lahontan Region Basin Plan [http://www.waterboards.ca.gov/lahtontan/BPlan/BPlan\\_Index.htm](http://www.waterboards.ca.gov/lahtontan/BPlan/BPlan_Index.htm).

- Please include both pre-construction and post construction stormwater management and best management practices as part of planning process.
- Please consider and incorporate designs that minimize impervious surfaces, such as surface parking areas, directing runoff onto vegetated areas using curb cuts and rock swales, etc., and infiltrating runoff as close to the source as possible to avoid forming erosion channels. Design features should be incorporated to ensure that runoff is not concentrated by the proposed project. The project must incorporate measures to

ensure that stormwater generated by the project is managed on-site both pre-and post construction. Please show on plan drawings the on-site stormwater control measures.

- Please consider development features that span the drainage channels or allow for broad crossings. Design features of future development should be incorporated to ensure that runoff is not concentrated by the proposed project, thereby causing downstream erosion.

Please note that obtaining a permit and conducting monitoring does not constitute adequate mitigation. Development and implementation of acceptable mitigation is required.

If you have any questions, please contact me at (760) 241-7376, or e-mail me at [mhakakian@waterboards.ca.gov](mailto:mhakakian@waterboards.ca.gov)

Sincerely,



Mack Hakakian, PG  
Engineering Geologist

MH/rc/CEQA comments/Lancaster Avenue K Transmission Water Main



# COUNTY OF LOS ANGELES

## DEPARTMENT OF PUBLIC WORKS

*"To Enrich Lives Through Effective and Caring Service"*

DEAN D. EFSTATHIOU, Acting Director

900 SOUTH FREMONT AVENUE  
ALHAMBRA, CALIFORNIA 91803-1331  
Telephone: (626) 458-5100  
<http://dpw.lacounty.gov>

ADDRESS ALL CORRESPONDENCE TO:  
P.O. BOX 1460  
ALHAMBRA, CALIFORNIA 91802-1460

IN REPLY PLEASE

REFER TO FILE: **WW-3**

April 13, 2008

*dc: SPINDLE, READING, MI*

Mr. James R. Williams  
Director of Public Works  
City of Lancaster  
44933 Fern Avenue  
Lancaster, CA 93534-2461

Dear Mr. Williams:

**LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 40, ANTELOPE VALLEY  
REGION NO. 4, LANCASTER  
AVENUE K TRANSMISSION MAIN, PHASES I - IV  
NEGATIVE DECLARATION  
RESPONSE TO COMMENTS FROM THE CITY OF LANCASTER**

Thank you for your comments to our Initial Study and Negative Declaration (ND) for the proposed Avenue K Transmission Main project. Most of the clarifications and corrections you noted in your letter have been incorporated into our Initial Study and Negative Declaration documents.

The following requirements will be incorporated in our project plans and specifications to address your concerns regarding the project's impacts to the transportation/traffic conditions along Avenue K:

1. Lane closures along Avenue K between 10th Street West and 20th Street West in the vicinity of the freeway on and off ramps will be restricted to after 7:30 a.m. and before 4 p.m., Monday through Friday. All excavations within a travel lane in this area shall be backfilled and or steel plated during all other times and open to traffic.
2. Installations under the major intersections along Avenue K will be conducted by jacking and boring instead of open-trench excavation to help reduce construction congestion at those intersections.

Mr. James R. Williams  
April 13, 2008  
Page 2

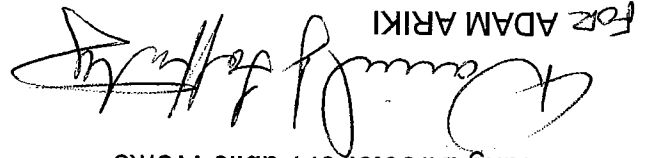
3. Lane closure signs will be posted along the project alignment a few weeks prior to construction commencement so that the traveling public has ample time to plan for an alternate route during construction.

The above measures are reflected in the project's traffic control plans, which are currently being reviewed by City of Lancaster staff. In addition, we will require the project contractor to obtain an Encroachment Permit from the City of Lancaster and to comply with the City's noise ordinance.

If you have any further questions or require additional information, please contact Mr. Michael Ignatius at (626) 300-3396 or at [mignatui@dpmw.lacounty.gov](mailto:mignatui@dpmw.lacounty.gov).

Very truly yours,

DEAN D. EFSTATHIOU  
Acting Director of Public Works



for ADAM ARIKI  
Assistant Deputy Director  
Waterworks Division

Ml:dv  
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December 21, 2007

Donald L. Wolfe  
Director of Public Works  
County of Los Angeles Department of Public Works  
900 South Fremont Avenue  
Alhambra, California 91803-1331

Re: Los Angeles County Waterworks District No. 40, Lancaster  
Avenue K Transmission Water Draft Negative Declaration  
and Initial Study

Dear Mr. Wolfe:

Thank you for the opportunity to review and comment on the Avenue K Transmission Main Draft Negative Declaration and Initial Study. The Lancaster Public Works Department believes this is a critical project for the waterworks system within the City. Please find below the Department's comments on the documents.

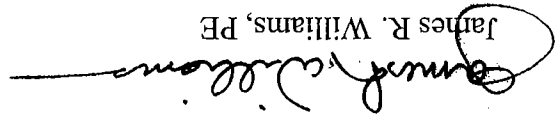
Generally, the City agrees with the document but strongly believes that section XV TRANSPORTATION/TRAFFIC requires a more detailed review regarding the impact of closing a lane or lanes of traffic during construction. Avenue K is one of the most heavily travelled thoroughfares in the City, especially between 30th Street West and 15th Street East. The most recent traffic volume counts obtained in May 2007 indicate there are approximately 28,200 ADT on this stretch of Avenue K and the travelling public will be significantly impacted during construction. If the contractor is allowed to work at night, there could be other traffic related impacts.

The balance of Public Works comments are minor clarifications/corrections. First, the project will fall under the jurisdiction of the Antelope Valley Air Quality Management District, not the South Coast Air Quality Management District as indicated on Page 2 of the Initial Study. On Page 5, section VI the consultant, Earth Systems, is incorrectly referred to as Earth Sciences. Any traffic control plans will need to be reviewed and approved by the City of Lancaster Traffic Division. Finally, the contractor will be required to comply with the City of Lancaster noise ordinance rather than the County noise ordinance.

It is requested that these comments be reviewed and incorporated into the initial Study and environmental documents. Should you have any questions, please contact Mr. Steve Dassler at (661) 723-6088.

Thank you again for the opportunity to review and comment on this important project.

Sincerely,

  
James R. Williams, PE

Director of Public Works

SD:ics

Bishop Henry W. Hearn  
Mayor

Andrew D. Visokey  
Vice Mayor

Jim Jeffra  
Council Member

Ed Sileo  
Council Member

Ronald D. Smith  
Council Member

Robert S. LaSala  
City Manager



DEAN D. EFSTATHIOU, Acting Director

900 SOUTH FREMONT AVENUE  
ALHAMBRA, CALIFORNIA 91803-1331  
Telephone: (626) 458-5100  
<http://dpw.lacounty.gov>

ADDRESS ALL CORRESPONDENCE TO:  
P.O. BOX 1460  
ALHAMBRA, CALIFORNIA 91802-1460

IN REPLY PLEASE  
REFER TO FILE: WW-2

April 22, 2008

*cc: SPINDLE, READING, MI*

Mr. Dave Singleton  
Native American Heritage Commission  
915 Capitol Mall, Room 364  
Sacramento, CA 95814

Dear Mr. Singleton:

**LOS ANGELES COUNTY WATERWORKS DISTRICT NO. 40, ANTELOPE VALLEY  
REGION NO. 4, LANCASTER  
AVENUE K TRANSMISSION WATER MAIN, PHASES I-IV  
NEGATIVE DECLARATION  
RESPONSE TO COMMENTS**

Thank you for your comments to our Initial Study and Negative Declaration (ND) for the proposed Avenue K Transmission Water Main project. Below are our responses to your comments, some of which have been addressed in the draft Negative Declaration. We have marked the specific concerns in your letter and numbered them so we can better address them. The numbers below match the numbers in the enclosed copy of your letter.

1. A Cultural Resources Records Search Quick Check was conducted for the subject project by the South Central Coastal Information Center located at the University of California, Los Angeles (UCLA), Institute of Archaeology. Their findings indicated that the project area has not been fully surveyed by a professional archaeologist and that cultural resources are likely to be in the area. Consequently, they recommended a Phase I Archaeologist Study be performed for the project area. A copy of the Quick Check is enclosed for your information.

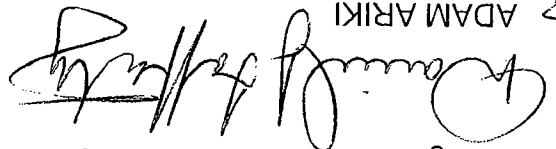
2. A Phase I Archaeological Study of the project area was performed in December 2000 by the Historical Environmental Archaeological Research Team. The study found no prehistoric or historic cultural resource remains in the project area. The study did not identify any foreseeable impact to cultural resources as a result of the project but mitigation provision will be outlined in the contract documents for identification and evaluation of discovered archaeological resources. A copy of the Phase I Archaeological Study Report is enclosed for your information.
3. Per recommendations in your letter, your agency performed a Sacred Lands File search on April 14, 2008, which revealed no Native American cultural resources in the immediate project area. A copy of the letter from your agency detailing the record search and recommendations is enclosed for your information.
4. In accordance with California Environmental Quality Act (CEQA) Guidelines, Section 15064.5(f) and in the event that historical or archaeological resources are encountered during construction, the contract documents will have provision to cease all construction activities as well as follow the recommendations outlined in the enclosed Phase I Archaeological Study to evaluate the discovered resources.
5. In the event that human remains are encountered during the course of construction, all construction activities in the vicinity of the discovery will be halted and the Los Angeles County Coroner will be notified. If the coroner determines that the remains are those of Native American ancestry, the Native American Heritage Commission (NAHC) shall be notified by telephone within 24 hours. Public Resources Code Sections 5097.94 and 5097.98 procedures shall be followed after notification of the NAHC. No work will be initiated until the issue has been properly addressed.
6. See note No. 5 above.
7. Since our research during the project planning revealed no cultural resources within the project area, avoidance as defined in Section 15370 of the CEQA Guidelines, was not applicable for this project. However, in the event a resource is encountered, the measures described in note No. 5 will be applied.

Mr. Dave Singleton  
April 22, 2008  
Page 3

If you have any further questions or require additional information, please contact Mr. Michael Ignatius at (626) 300-3396 or at [mignatius@dpw.lacounty.gov](mailto:mignatius@dpw.lacounty.gov).

Very truly yours,

DEAN D. EFSTATHIOU  
Acting Director of Public Works



ADAM ARIKI

Assistant Deputy Director  
Waterworks Division

MI:lr  
EH001

Enc.



NATIVE AMERICAN HERITAGE COMMISSION

915 CAPITOL MALL, ROOM 364  
SACRAMENTO, CA 95814  
(916) 653-6251  
Fax (916) 657-5390  
Web Site [www.nahc.ca.gov](http://www.nahc.ca.gov)  
e-mail: [ds\\_nahc@pacbell.net](mailto:ds_nahc@pacbell.net)

December 7, 2007

Mr. Michael Ignatius  
LOS ANGELES DEPARTMENT OF PUBLIC WORKS, WATERWORKS DIVISION-DISTRICT 40  
P.O. BOX 1460  
ALHAMBRA, CA 91802-1450

Re: SCH#2007111107, CEQA Notice of Completion, AVENUE K TRANSMISSION WATER MAIN, PHASE I-IV,  
Lancaster, District No. 40, Los Angeles County, California

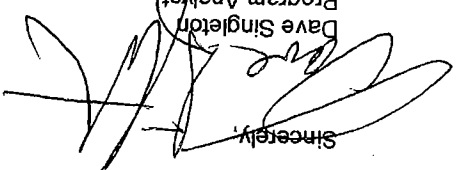
Dear Mr. Ignatius:

The Native American Heritage Commission is the state agency designated to protect California's Native American Cultural Resources. The California Environmental Quality Act (CEQA) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per CEQA guidelines § 15064.5(b)(c). In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect' (APE), and if so, to mitigate that effect. To adequately assess the project-related impacts on historical resources, the Commission recommends the following action:

1. ✓ Contact the appropriate California Historic Resources Information Center (CHRIS). Contact information for the Information Center nearest you is available from the State Office of Historic Preservation (916/653-7278)/<http://www.ohp.parks.ca.gov/files/1068/files/IC%20Roster.pdf>. The record search will determine:
  - If a part or the entire APE has been previously surveyed for cultural resources.
  - If any known cultural resources have already been recorded in or adjacent to the APE.
  - If the probability is low, moderate, or high that cultural resources are located in the APE.
  - If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
  - The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure.
  - The final written report should be submitted within 3 months after work has been completed to the appropriate regional archaeological Information Center.
3. ✓ Contact the Native American Heritage Commission (NAHC) for:
  - A Sacred Lands File (SLF) search of the project area and information on tribal contacts in the project vicinity that may have additional cultural resource information. Please provide this office with the following information format to assist with the Sacred Lands File search request: USGS 7.5-minute quadrangle citation with name, township, range and section.
  - The NAHC advises the use of Native American Monitors to ensure proper identification and care given cultural resources that may be discovered. The NAHC recommends that contact be made with Native American contacts on the attached list to get their input on potential project impact (APE). In some cases, the existence of a Native American cultural resources may be known only to a local tribe(s).
4. ✓ Lack of surface evidence of archaeological resources does not preclude their subsurface existence.
  - Lead agencies should include in their mitigation plan provisions for the identification and evaluation of accidentally discovered archaeological resources, per California Environmental Quality Act (CEQA) § 15064.5 (f).
  - American, with knowledge in cultural resources, should monitor all ground-disturbing activities.
  - Lead agencies should include in their mitigation plan provisions for the disposition of recovered artifacts, in consultation with culturally affiliated Native Americans.
5. ✓ Lead agencies should include provisions for discovery of Native American human remains or unmarked cemeteries in their mitigation plans.
  - CEQA Guidelines, Section 15064.5(d) requires the lead agency to work with the Native Americans identified by this Commission if the initial Study identifies the presence or likely presence of Native American human remains within the APE. CEQA Guidelines provide for agreements with Native American, identified by the

- NAHC, to assure the appropriate and dignified treatment of Native American human remains and any associated grave liens.
6. ✓ Health and Safety Code §7050.5, Public Resources Code §5097.98 and Sec. §15064.5 (d) of the CEQA Guidelines mandate procedures to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery.
7. ✓ Lead agencies should consider avoidance, as defined in § 15370 of the CEQA Guidelines, when significant cultural resources are discovered during the course of project planning and implementation.

Please feel free to contact me at (916) 653-6251 if you have any questions.

Sincerely,  
  
 Dave Singleton  
 Program Analyst

Attachment: List of Native American Contacts

Cc: State Clearinghouse

**Native American Contacts  
Los Angeles County  
December 7, 2007**

**San Fernando Band of Mission Indians**

**John Valenzuela, Chairperson**

**P.O. Box 221838**

**Newhall, CA 91322**

**tsen2u@msn.com  
(661) 753-9833 Office**

**(760) 885-0955 Cell**

**(760) 949-1604 Fax**

**Fernandeno  
Tataviam  
Serrano  
Vanyume  
Kitanemuk**

**Charles Cooke**

**32835 Santiago Road**

**Action, CA 93510**

**(661) 269-1422**

**(661) 733-1812**

**Chumash  
Fernandeno  
Tataviam  
Kitanemuk**

**Beverly Salazar Folkes**

**1931 Shadybrook Drive**

**Thousand Oaks, CA 91362**

**805 492-7255**

**Chumash  
Tataviam  
Fernandeno**

**Fernandeno Tataviam Band of Mission Indians**

**Randy Guzman-Folkes, Cultural/Environ Depart**

**601 South Brand Boulevard, Suite 102**

**San Fernando, CA 91340  
Fernandeno  
Tataviam**

**ced@tataviam.org**

**(818) 837-0794 Office**

**(805) 501-5279 Cell**

**(818) 837-0796 Fax**

**LA City/County Native American Indian Comm  
Ron Andrade, Director**

**3175 West 6th Street, Rm. 403**

**Los Angeles, CA 90020**

**(213) 351-5324**

**(213) 386-3995 FAX**

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native American with regard to cultural resources for the proposed SCH#2002071112; CEQA Notice of Completion; Negative Declaration of the Avenue K Transmission Main, Phase I-IV; Los Angeles County Department of Public Works, Waterworks Division; Los Angeles County, California.

**Cultural Resources Records Search  
Quick Check**

Lead Agency: Los Angeles County, DPW, Waterworks Division

Permit/Project #: Avenue K Watermain Date: October 25, 1999

Case Planner: Anh Hoang USGS Quad: Lancaster East 7.5 min and Lancaster West 7.5 min

Brief Project Description: Installation of approximately 21,300 ft of a 36 inch diameter pipeline along Avenue K from 10<sup>th</sup> St. West to 30<sup>th</sup> St. East

**\* UCLA ARCHAEOLOGICAL INFORMATION CENTER INITIAL RECORDS SEARCH**

// The project area has been (fully) (partially) surveyed by a professional archaeologist and no cultural resources were found.

// The project area has been (fully) (partially) surveyed by a professional archaeologist and cultural resources were found.

/X/ The project area has not been (fully) surveyed by a professional archaeologist but cultural resources are likely to be in the area.

// The project area has not been (fully) surveyed by a professional archaeologist and cultural resources are not likely to be in the area.

**RECOMMENDATIONS**

/X/ A Phase I \* archaeological survey should be done by a professional archaeologist prior to approval of project plans.

// A Phase II \*\* testing program for determination of significance.

// A professional archaeologist should be retained to monitor any earth moving operations.

// No archaeological work is needed prior to approval of the project plans. However, a halt-work condition should be in place in the event that cultural resources are discovered during construction.

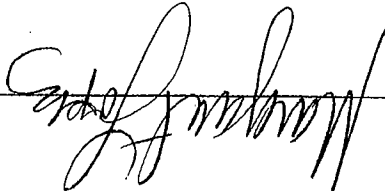
**COMMENTS**

Our records indicate that the proposed project area has not been completely surveyed. There have been two surveys conducted along small portions of Avenue K in which historic resources were found. Because these limited surveys are more than five years old and considered out of date by State standards in addition to known historic resources within the area, our office recommends that a Phase I archaeological survey be conducted by an archaeologist prior to any ground disturbance. If you have any questions concerning our comments or recommendations, please feel free to contact our office at (310) 825-1980.



\*\*This Quick Check does not cover cultural heritage sites, either listed or pending, such as historic buildings or points of interest.

\*\* Phase I survey and Phase II testing includes a complete records search, field evaluation, and a final report with results and recommendations.

Date Completed: October 25, 1999 Signature: 

Letter attached / /

Invoice 8138

A Phase 1 Archaeological Study For  
Design Services Los Angeles County Waterworks District No. 40  
31,000 Feet Of New Transmission Pipeline Along  
Avenue K Transmission Main Phases I, II, III, and IV  
Antelope Valley, County of Los Angeles, California

Prepared and submitted to:

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December, 2000

## Executive Summary

At the request of Brockmeier, Consulting Engineers, Inc. of Santa Monica, California, A Phase 1 Archaeological Study was prepared for an environmental document in support of Design Services Los Angeles County Waterworks District No. 40, 31,000 Feet Of New Transmission Pipeline Along Avenue K Transmission Main Phases I, II, III, and IV, Antelope Valley, County of Los Angeles, California. This document was intended to:

- \* Assist the client in achieving compliance with federal, state and county laws and policies regulating the performance of cultural resource studies in the County of Los Angeles.
- \* Integrate data obtained through a records search phase conducted by the South Central Coastal Information Center, California State University, Fullerton, Department of Anthropology, Fullerton, California (Appendix A).
- \* Research additional historical maps and studies pertaining to the project area.
- \* Perform an on-foot field reconnaissance for the 31,000 feet of proposed Transmission Pipeline along Avenue K. The survey area will consist of the paved street and a buffer of 15 feet (4.5 meters) on either side and at either end of the alignment. Proposed project impacts are projected to occur within existing, paved street right-of-way.
- \* Prepare a report documenting the results of the records search and field reconnaissance project phases which complies with appropriate federal and state cultural resource legislative enactments.
- \* Provide recommendations for alleviating adverse impacts to cultural resources encountered during the course of the records search and field reconnaissance project phases.

The project involves the construction of a new 31,000 feet long (9,300 meters) of new transmission pipeline along Avenue K in Lancaster, California. The project follows the existing street (Avenue K) from 30th Street West (forming the western project terminus) to 30th Street East (forming the eastern project terminus). The proposed alignment will essentially follow Avenue K in an east-west direction, lying on both sides of Highway 14, with the placement of the pipeline within the existing road alignment. The survey area will consist of the paved street and an additional buffer of 15 feet (4.5 meters) on either side and at either end of the alignment. Elevations within the right-of-way range from 2385 on the west, to 2424 on the east. Proposed project impacts will be confined to previously modified and disturbed areas within existing roadway.

The results of the records search phase indicated that

- \* No prehistoric archaeological sites or isolates are identified within the project area.
- \* Two historic archaeological sites (19-001526 and 19-001527) have been identified within fifty feet of Avenue K, on the south side of the road between 20th Street and 30th Street. 19-001526 was recorded in 1989 by Richard Norwood of RT Factfinders as a pre-1915 homestead with associated household debris scattered over a large area. 19-001527 was recorded in 1990 by William Manley of Regional Environmental Consultants as a light trash scatter, water tank and well. No foundations were observed. Both sites are not located within the roadway and represent turn-of-the-century (1900-1920) occupation of the area.
- \* Nine prior surveys/excavations have been performed within a one-quarter mile radius of the study area (Anon 1996 - LA4008; Eggers, A.V. 1975 - LA2033; King, C. 1998 - LA 4392; Love 1988 - LA249; Love and DeWitt 1990a - LA2055, and 1990b - LA2088; Norwood 1989a - LA1761 and 1989b - LA1763; and Manley 1990 - LA1990). All of these surveys overlap small portions of the project area.

- \* No properties are listed on the National Register of Historic Places within the study area.
- \* No properties listed on the California State Historic Resources Inventory (HRI) lie within the study area.
- \* No California Historical Landmarks (1990), Office of Historic Preservation, California Department of Parks and Recreation are recorded within the project area.
- \* No California Points of Historical Interest (1992) are listed within the project area.

An inspection of historical maps (1854-1917) including the Elizabeth Lake USGS map series (1917 edition) indicated that by the early 1900s, a loose network of improved and unimproved roads was in place and scattered structures including residences, ranches and mining related buildings existed in the general area. Rosamond, Lancaster, Palmdale, Littlerock, Elizabeth Lake, Maynard, a dry lake the A.T.S.F railroad and the Southern Pacific Railroad (San Francisco and New Orleans Line) are listed by 1910. By the late 1920s (Lancaster USGS map (1929-31), Lancaster has major roads in place with development spreading in all directions from the heart of the city.

The on-foot field investigation was performed on Tuesday, December 19, 2000 by Robert Wlodarski serving in the capacity of Principal Investigator, and Dan Larson who performed the duties of Survey Archaeologist. The entire length of the proposed alignment was surveyed. Since the project area is currently paved, the surveyors inspected a 15-foot area (4.5 meters) on either side of Avenue K to assess potentially undisturbed soils adjacent to the proposed alignment. A total of sixteen person-hours were required to complete the field phase of this project.

## Results

No prehistoric or historic cultural resource remains were encountered during the field phase. Based on a thorough investigation of the proposed project alignment, the entire route will be constructed within graded and highly disturbed roadbed. The field investigation also inspected off-road areas including the shoulder, rodent burrows, exposed trenches, existing waterways, and other fortuitous exposures to ensure that no surface cultural resource remains would be affected by the proposed project.

## Conclusions/Recommendations

No foreseeable impacts to identified cultural resources are anticipated as a result of this project. This report only addresses the area illustrated in Figures 2a-2b. The results of this report cannot be used for any changes or modifications to the proposed project as discussed within the context of this report. Any subsequent changes will require additional work.

Since by its nature, a walk-over can only confidently assess the potential for encountering surface cultural resource remains, customary caution is advised when developing within the project area. Therefore, should unanticipated cultural resource remains be encountered during construction or land modification activities, work must stop, and the County of Los Angeles Planning Director shall be contacted immediately to the determine appropriate measures to mitigate adverse impacts to the discovered resources. Cultural resource remains may include artifacts, shell, bone, features, altered soils, foundations, trash pits and privies, etc. If human remains are discovered, then the procedures described in Section 7050.5 of the California Health and Safety Code shall be followed. These procedures require notification of the coroner. If the coroner determines that the remains are those of Native American ancestry, then the Native American Heritage Commission (NAHC) must be notified by phone within 24 hours. Sections 5097.94 and 5097.98 of the Public Resources Code, describe the procedures to be followed after the notification of the NAHC.

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# Introduction

## 1.1 Scope of the Project

At the request of Brockmeier, Consulting Engineers, Inc. of Santa Monica, California, A Phase 1 Archaeological Study was prepared for an environmental document in support of Design Services Los Angeles County Waterworks District No. 40, 31,000 Feet of new transmission pipeline along Avenue K Transmission Main Phases I, II, III, and IV, Antelope Valley, County of Los Angeles, California. The objectives of this study were to:

1. Assist the client in achieving compliance with federal, state and county laws and policies which regulate the performance of cultural resource studies within Los Angeles County.
2. Integrate data obtained through a records search phase conducted by the South Central Coastal Information Center, California State University, Fullerton, Department of Anthropology, Fullerton, California (Appendix A).
3. Investigate additional, applicable historical source material including maps and studies pertaining to the project area.
4. Perform an on-foot archaeological reconnaissance for the 31,000 feet of new Transmission Pipeline along Avenue K. The survey area will consist of the paved street and an additional buffer of 15 feet (4.5 meters) on either side and at either end of the alignment. Proposed project impacts will be confined to previously modified and developed areas.
5. Prepare a report documenting the results of the records search and field reconnaissance phases which complies with federal and state cultural resource legislative enactments.
6. Provide recommendations for alleviating adverse impacts to cultural resources encountered during the course of the records search and field reconnaissance project phases.

## 1.2 Description of the Project

The project involves the construction of a new 31,000 feet long (9,300 meters) of new transmission pipeline along Avenue K in Lancaster, California. The project follows the existing street (Avenue K) from 30th Street West (forming the western project terminus) to 30th Street East (forming the eastern project terminus). The proposed alignment will essentially follow Avenue K in an east-west direction, lying on both sides of Highway 14, with the placement of the pipeline within the existing road alignment. The survey area will consist of the paved street and an additional buffer of 15 feet (4.5 meters) on either side and at either end of the alignment. Proposed impacts will be confined to previously modified and disturbed areas within existing roadway.

## 1.3 Location of the Project

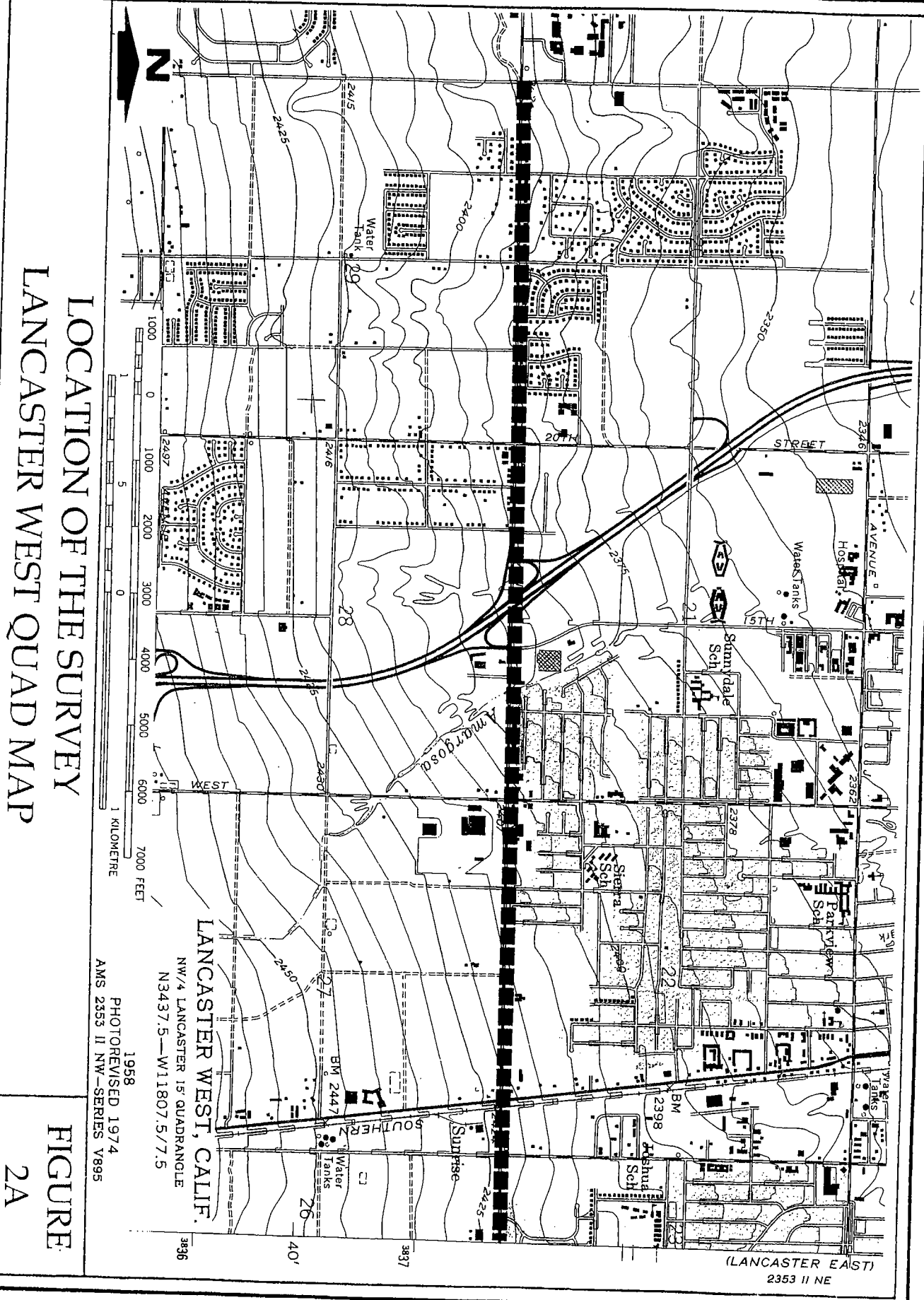
The project area is situated northeast of the San Fernando Valley, south of Edwards Air Force Base and north of Palmdale in the Antelope Valley within the Lancaster city limits (Figure 1). The project alignment can be found on the Lancaster East USGS Topographic map (1958 - photorevised 1974) encompassing portions of Sections 3, 19, 20 and 29 of Township 7 North and Range 11 West, and on the Lancaster West USGS Topographic map (1958 - photorevised 1974) encompassing portions of Sections 19 through 30) of Township 7 North and Range 12 West (Figure 2).

## Environmental Summary

### 2.1 Physiography

The Antelope Valley is located in the westernmost portion of the Mojave Desert and consists of

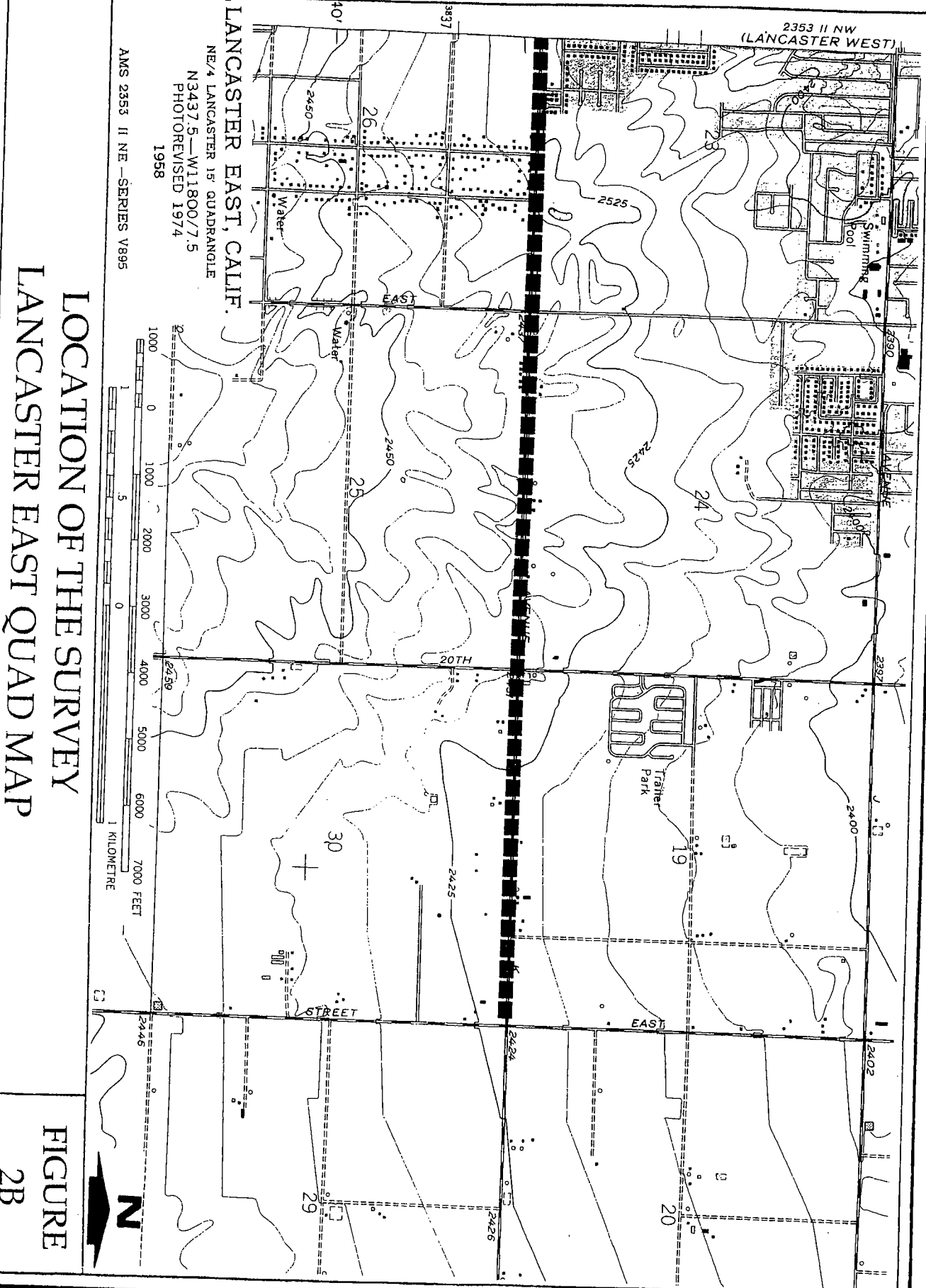




LOCATION OF THE SURVEY  
LANCASTER WEST QUAD MAP

FIGURE  
2A





LOCATION OF THE SURVEY  
LANCASTER EAST QUAD MAP

FIGURE  
2B

The Serrano were accomplished potters and basket makers. Their pottery was made of coiled clay, smoothed with a paddle and dried in the sun before being fired in a pit. Baskets were fabricated from yucca fiber, willow, reeds, and local grasses. Their artifact inventory included: musical instruments such as rattles, flutes, and whistles; utensils and ornaments such as fire drills, pipes, mortars, metates, beads, pendants, awls, and projectile points from wood, shell, bone and stone. Petroglyphs abound on rock surfaces in the Serrano territory. Abstract and geometric designs are interspersed with representational figures of sheep, lizards, human beings, and possible celestial bodies. They are typical of those found throughout the Great Basin area.

Primary Serrano villages were located in the foothills with some settlements situated in higher transitions zones as well as along the desert floor. Access to water was the determining factor in selecting habitation sites. They lived in single-family dwellings which were circular, domed structures constructed over an excavated area. The houses had willow frames covered over with tule and brush mats secured to the framework, and served primarily as sleeping areas. A majority of the activities took place outside or under roofed structures without walls, called ramadas. The only other buildings in the villages were ceremonial houses occupied by the village priest and used for religious rites and ceremonial activities, and a granary for storing provisions (Stickel and Weinman-Roberts, 1980:99).

The Serrano spoke a Takic language. Takic speaking groups historically occupied the Los Angeles Basin off shore islands and surrounding areas extending south to the San Luis Rey River and east to the Mojave sink and the Coachella Valley and north to the San Joaquin Valley apparently established themselves in the area around 800 BC. The Takic languages are a division of the Uto-Aztecan language stock. People speaking the ancestral Takic language may have been able to establish themselves because of their more complex political organization.

At the time of Spanish exploration, the project area was occupied by the Serrano who were also called Vanyume or Kitanemuk (Figure 3). They consisted of autonomous localized sibs and their land-holding lineages were further divided into exogamous totemic moieties with ritual and ceremonial obligations (Kroeber, 1925:615-616). Each clan retained control over several areas (usually a creek and the strip of land surrounding it) from which they gathered their food resources during the course of the year. They were also part of a larger trade network that extended throughout California. Coalitions with other Serrano clans were based on reciprocal ceremonial, marital and economic relationships. They also established alliances with similarly organized Cahuilla, Chemehuevi, Gabriellino, and Cupeno.

### 3.1 Prehistoric Information

## Cultural Setting

### III

roughly 3,000 square miles of land. The valley is bordered on the northwest by the Tehachapi Mountains which separates this land mass from the San Joaquin Valley, and on the south and southwest by the San Gabriel Mountains. The northern and eastern boundaries consist of isolated buttes. This geomorphic basin has no outlet for its streams, and all rain water either becomes part of the underground aquifer or settles in the lower part of the valley. Twelve creeks trend into the valley from the south and transport precious water into the area during the rainy season including Sheep, Bone Yard, Muscal, Deadman, Pallett, Boulder, La Montaine, Bob's Gap, Big Rock, Sand, Little Rock and Amargosa. The San Andreas Fault trends along the entire southern slope of the Antelope valley forming a series of long, narrow, enclosed basins.

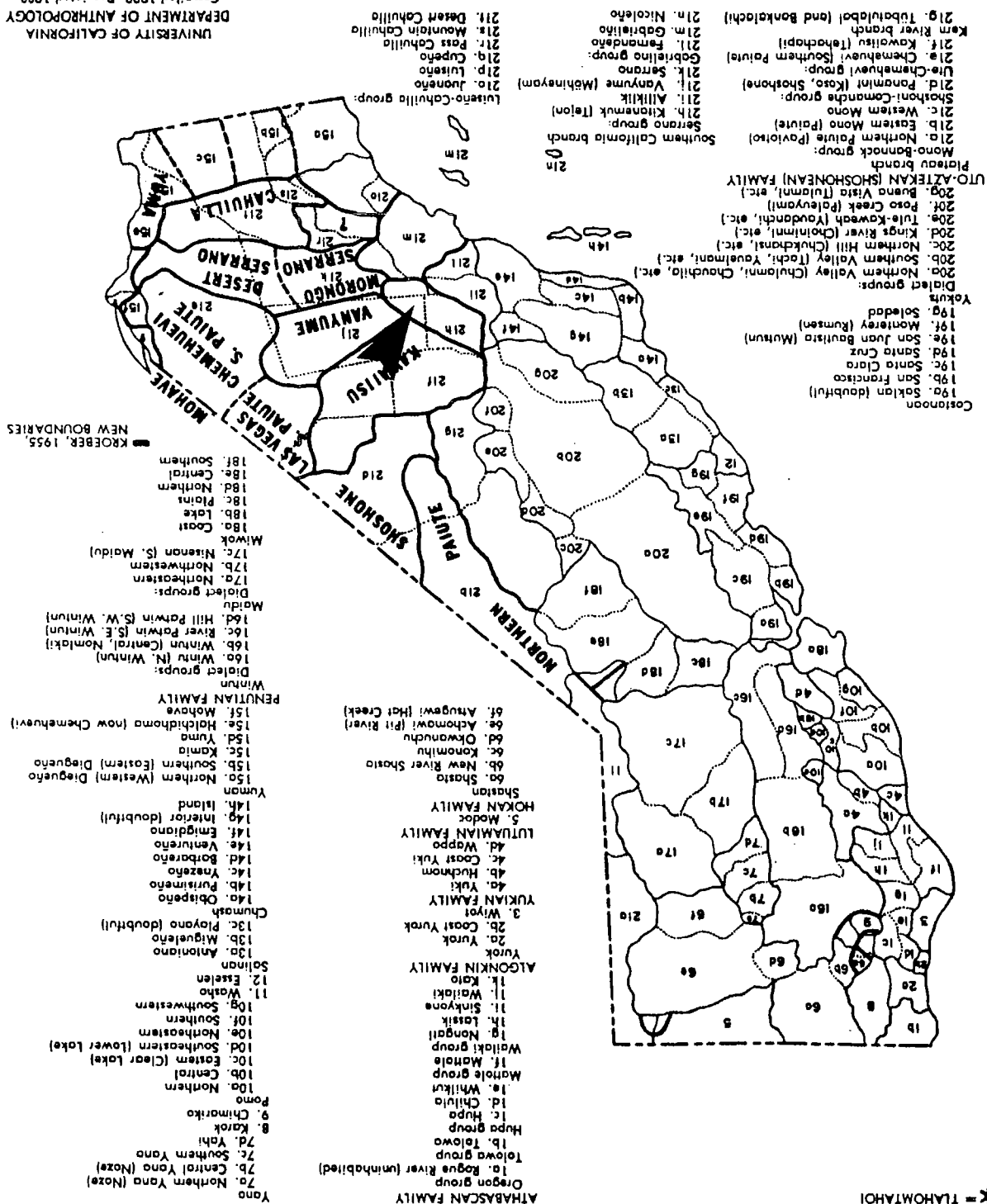
# PROJECT AREA IN RELATION TO TRIBAL BOUNDARIES

FIGURE 3

Modifications made by Kroeber on the basis of research after 1922.

MAP 20

UNIVERSITY OF CALIFORNIA  
DEPARTMENT OF ANTHROPOLOGY  
Compiled 1922, Reprinted 1933



NATIVE TRIBES, GROUPS, DIALECTS, AND FAMILIES OF CALIFORNIA IN 1770

The Serrano sustained a hunting and gathering economy, exploiting virtually every possible food resource in their environment. Hunting was generally the task of the males who used bows and arrows, throwing sticks, traps and snares to catch deer, antelope, mountain sheep, rabbits, and other rodents, and various birds, especially quail. The women collected seeds, tubers, roots, acorn and pinon nuts. Although they did not engage in agricultural activities per say, the Serrano manipulated the natural plant environment by annually harvesting the acorn crop and by burning areas where chia seeds grew, thereby increasing the yield (Stichel & Weinman-Roberts 1980: 100). Abandonment of the permanent Anasazi settlements in the southern parts of Nevada and Utah at the beginning of this period ended their influence in the Mojave. At this time, there is a noticeable change in point types, as the Cottonwood series and the small Desert Side Notched series become the predominant types. These points are generally associated with the Numic expansion throughout much of California and the Great Basin. Knowledge concerning the Serrano is summarized by Bean and Smith (1978) while Bean and Blackburn (1978) summarized the closely related Kitaneumuk. The evolution of Serrano society resulted in a complex and unique society described by early Spanish explorers and colonists after AD 1603.

### 3.3 Historical Information

There were no known permanent village on the floor of the Antelope Valley. Instead, the desert valley provided trade routes from Arizona and New Mexico to the California coast. Although California was discovered in the 1500s, it was not until the later part of the 1700s that exploration was initiated. Captain Pedro Fages, an officer in Portola's expedition, is credited as being the first white man to set foot in the Antelope Valley in 1772. Franciscan Friar, Father Garcés, crossed the western end of the Antelope Valley in 1776 while traveling from the Colorado River to the five coastal missions that were in existence. During 1827, Jedediah Smith traversed the Antelope Valley as the first American to visit California by land. By 1829, Kit Carson, while trapping, explored portions of the Antelope Valley. Gold was first discovered by Francisco Lopez in 1842 at the southern edge of the Antelope Valley in what is now Placerita Canyon bringing a brief influx of miners to the region. Finally, John C. Fremont, during 1844, conducted a scientific exploration of the region (Figure 4).

From the 1840s the valley was used primarily for hunting antelope and as a hideout for bandits like Joaquin Murrieta and Tiburcio Vasquez. Don Alexander and Phineas Banning established the first stage line from Los Angeles to the north, running through the southernmost edge of the Antelope Valley. During the 1870s, small ranches and homesteads sprang up around surface water sources. The Southern Pacific Railroad completed a line through the Antelope Valley in September, 1876. With the completion of the railroad, the settlers came, and Palmdale and the Antelope Valley ended years of isolation. Figures 5-7 illustrate the growth and development of the area from 1884-1929. Today, Edwards Air Force base, a thriving defense economy, and people looking for a less hectic lifestyle, have created a rapidly growing suburban environment in Lancaster and Palmdale.

## IV. Background Research Information

As part of this study, research was conducted for the project area using information obtained from historic maps, archival data, and prior studies. An inspection of the following sources included:

1. A records search phase conducted by the South Central Coastal Information Center,

FIGURE 4

## THE GENERAL AREA IN 1845

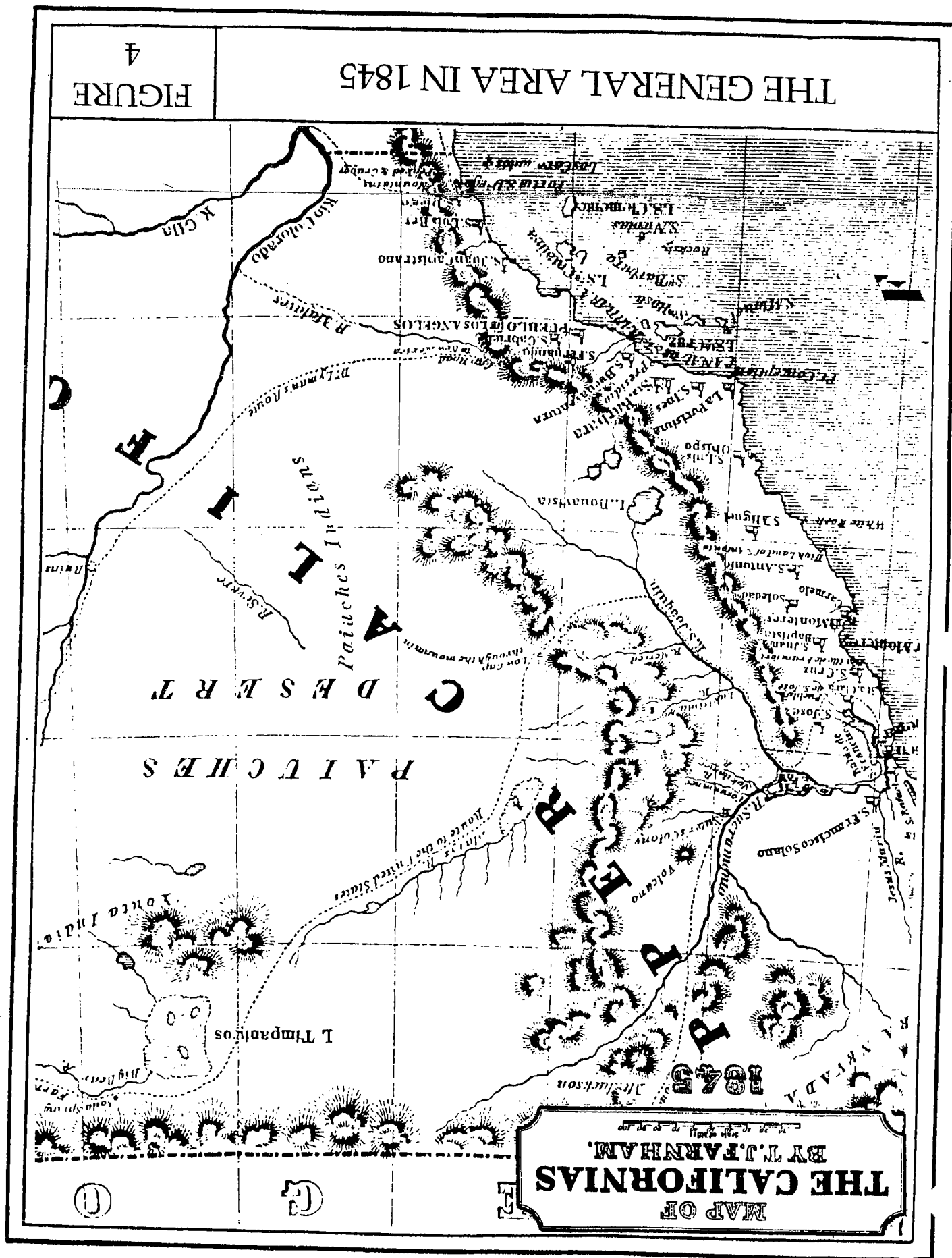
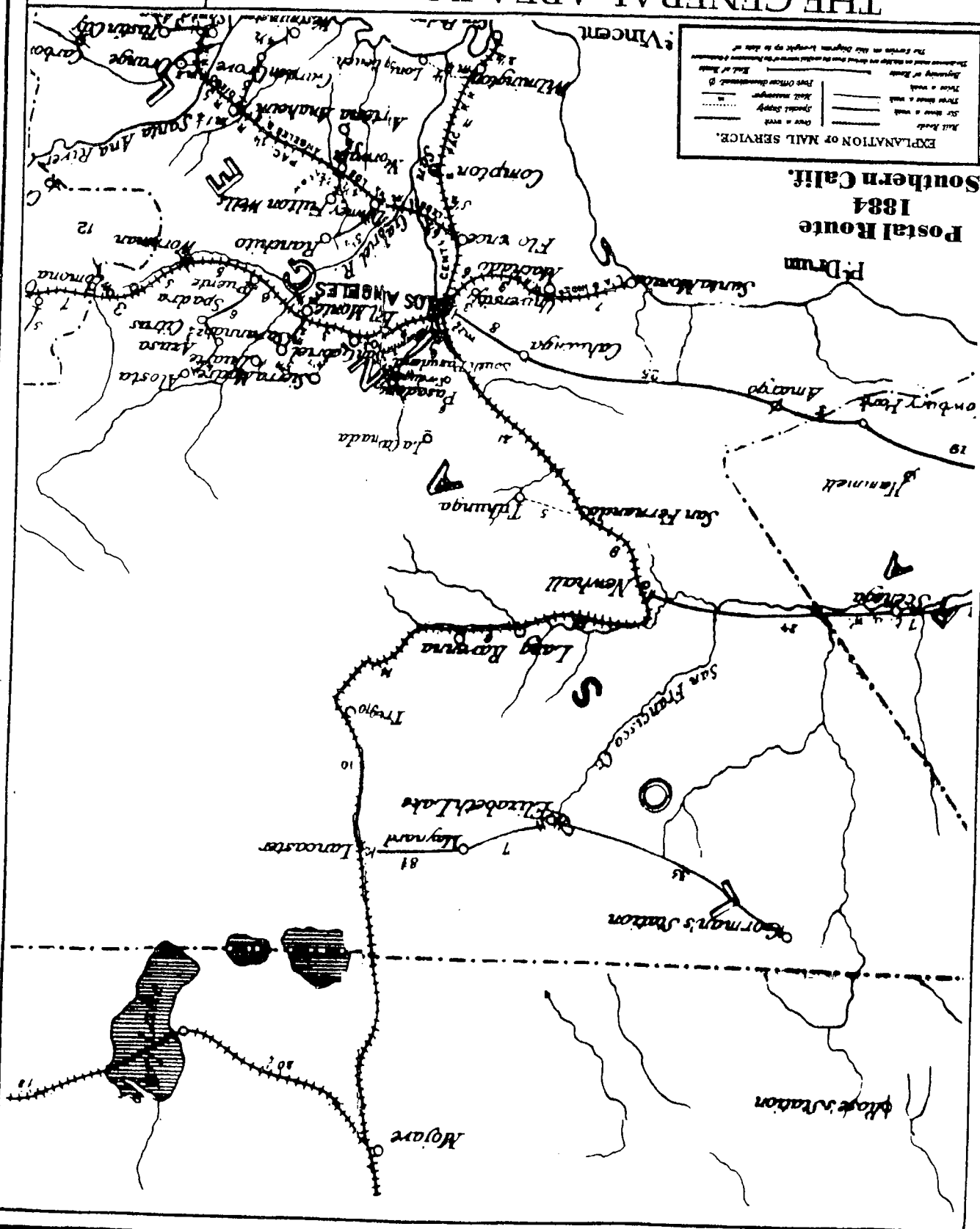
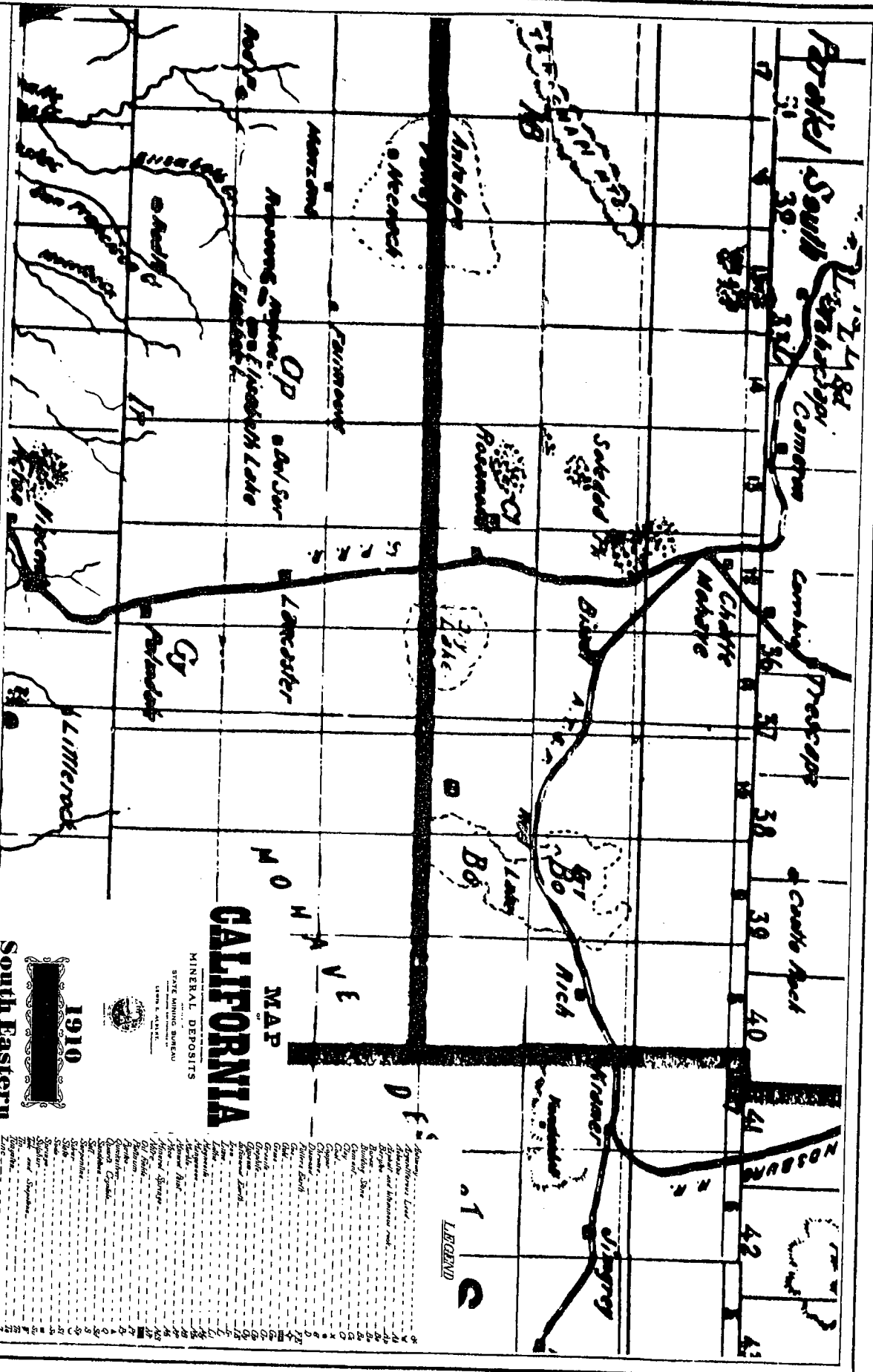


FIGURE 5

THE GENERAL AREA IN 1884  
SHOWING POSTAL ROUTES





THE GENERAL AREA IN 1910

FIGURE



FIGURE 7



2. National Register of Historic Places (Federal Register-8/94-with supplements to date).
3. California State Historic Resources Inventory (HRI) (Department of Parks and Recreation 1976).
4. California Historic Landmarks (California Department of Parks and Recreation 1990).
5. California Points of Historical Interest (1992).

The results of the records search phase indicated that

- \* No prehistoric archaeological sites or isolates have been identified within or directly adjacent to the project area.
- \* Two historic archaeological sites (19-001526 and 19-001527) have been identified within fifty feet of Avenue K, on the south side of the road between 20th Street and 30th Street. 19-001526 was recorded in 1989 by Richard Norwood of RT Factfinders as a pre-1915 homestead with associated household debris scattered over a large area. 19-001527 was recorded in 1990 by William Manley of Regional Environmental Consultants as a light trash scatter, water tank and well. No foundations were observed. Both sites are not located within the roadway and represent turn-of-the-century (1900-1920) occupation of the area.
- \* Nine prior surveys/excavations have been performed within a one-quarter mile radius of the study area (Anon 1996 - LA4008; Eggers, A.V. 1975 - LA2033; King, C. 1998 - LA 4392; Love 1988 - LA249; Love and DeWitt 1990a - LA2055, and 1990b - LA2088; Norwood 1989a - LA1761 and 1989b - LA1763; and Manley 1990 - LA1990). All of these surveys overlap small portions of the project area.
- \* No properties are listed on the National Register of Historic Places within the study area.
- \* No properties listed on the California State Historic Resources Inventory (HRI) lie within the study area.
- \* No California Historic Landmarks (1990), Office of Historic Preservation, California Department of Parks and Recreation are recorded within the project area.
- \* No California Points of Historical Interest (1992) are listed within the project area.

An inspection of historical maps (1854-1917) on file at the Geography Department Map Reference Center, California State University, Northridge, and County of Los Angeles, Department of Public Works, Bureau of Engineering, included:

- 1854-76 Township 7 North, Range 11 and 12 West, San Bernardino Meridian.
- 1869 Map of Private Grants and Public Lands Adjacent to Los Angeles and San Diego in the Southern Parts of California (published by Clinton Day).
- 1881 Map of the County of Los Angeles, California (by H.J. Stevenson).
- 1888 Map of the County of Los Angeles, California (by Rowan).
- 1891 Map of the Reservoir Lands in the County of Los Angeles (by Seebold).
- 1900 Sectional and Road Map of Los Angeles County Showing Oil and Mining Districts (by Stoll and Thayer).
- 1900 Elizabeth Lake USGS map series (1917 edition).
- 1908 Topographic Map of the Los Angeles Aqueduct and Adjacent Territory (compiled from U.S.G.S. topographic maps; Wheeler's war maps; Le Conte's maps; county maps, and; L.A. Aqueduct maps).
- 1911 Los Angeles County (Blunt).
- 1958 Lancaster 15 minute USGS topographic map (surveyed in 1929-31).

## Field Reconnaissance Phase

### 5.1 Crew

The crew consisted of Robert Wlodarski, the Principal Investigator of H.F.A.R.T., who has a B.A. in History and Anthropology; an M.A. in Anthropology from California State University Northridge (CSUN); 30 years of professional experience in California archaeology; over 500 individual projects completed; certification in field archaeology, and theoretical/archival research by the Register of Professional Archaeologists [RPA]; and, is a registered California historian by the California Committee for the Promotion of History [CCPH]. The Principal Investigator was assisted in the field by Dan Larson who has a B.A. in Anthropology from California State University Northridge (CSUN), with over 36 years of professional experience in California archaeology, and meets the qualifications for certification in field archaeology by the Register of Professional Archaeologists [RPA].

### 5.2 Field Reconnaissance Strategy

The field reconnaissance for the proposed pipeline entailed a mixed survey strategy which included: A survey by car of those areas which are completely covered by pavement or where development has completely covered the surface; and an on-foot reconnaissance of all areas within the proposed alignment which were essentially open space elements (open fields or exposed dirt shoulders). For this project, an additional buffer of 15 feet (4.5 meters) on either side and at either end of the alignment were inspected to determine if cultural resource remains of a prehistoric or historic archaeological nature would be affected by the proposed project.

### 5.3 Results

The on-foot field investigation was performed on Tuesday, December 19, 2000 by Robert Wlodarski serving in the capacity of Principal Investigator, and Dan Larson who performed the duties of Survey Archaeologist. The entire length of the proposed alignment was surveyed. Since the project area is currently paved, the surveyors inspected a 15-foot area (4.5 meters) on either side of Avenue K to assess potentially undisturbed soils adjacent to the proposed alignment. A total of sixteen person-hours were required to complete the field phase of this project.

No prehistoric or historic cultural resource remains were encountered during the field phase. Based on a thorough investigation of the proposed project alignment, the entire route will be constructed within graded and highly disturbed roadbed. The field investigation also inspected off-road areas including the shoulder, rodent burrows, exposed trenches, existing waterways, and other fortuitous exposures to ensure that no surface cultural resource remains would be affected by the proposed project. The field results and notations about existing conditions in field follows:

### Western portion of the project

Proceeding west along Avenue K on the north side of the road: Northside shopping center (including Carl's Junior, Burger King, Toys-r-us, Coco's, Highway 14 overpass and on-ramp; Park Plaza; Century 21 Office; Eye Care and Dental Center; Oakwood Building (including Infinity Mortgage and Troth Realty); open lot; 20th Street; Denny's; Clocktower Plaza and parking; residential development with brick wall fronting Avenue K; 22nd Street West; residential development with brick wall fronting Avenue K; 24th Street West; residential development with brick wall fronting Avenue K; 25th Street West; residential development (including 2539-2647

residential development with brick wall fronting Avenue K East; apartments; Texaco gas station; Challenger Way; brick building and parking lot under construction; open lot with dirt shoulder; 8th Street East; residential development; open lot with a dirt shoulder; 7th Street East; residential development with brick wall fronting Avenue K East; 6th Street East; residential development lot; blue, clapboard house; open lot with a dirt shoulder; Stanridge condo unit with parallel asphalt road; open lot with a dirt shoulder; Liquor mart (8 ball); Division Street; Arco gas station; parking lot; open lot; railroad tracks; Sierra Highway; Smog Center; Karen's Kitchen; open space; Muffler Shop; open lot; building; The Colony Park condos with asphalt road paralleling Avenue K West; Elm Avenue; residential development with brick wall fronting Avenue K West; Fig Avenue; Avenue; plaza; Firestone Tires; used car lot; RV rentals; Enterprise rental cars; Chevron station; 10th Street West; used car lot; KC Custom Mouldings; KFC; sup mall; Designer Furniture; 12th Street West; Quick Key; First Place Awards; Quality Care Providers; drainage channel; paved open space; Toys R Us shopping center; 15th Street West.

#### 5.4 Conclusions/Recommendations

No foreseeable impacts to identified cultural resources are anticipated as a result of this project. This report only addresses the area illustrated in Figures 2a-2b. The results of this report cannot be used for any changes or modifications to the proposed project as discussed within the context of this report. Any subsequent changes will require additional work.

Since by its nature, a walk-over can only confidently assess the potential for encountering surface cultural resource remains, customary caution is advised when developing within the project area. Therefore, should unanticipated cultural resource remains be encountered during construction or land modification activities, work must stop, and the County of Los Angeles Planning Director shall be contacted immediately to the determine appropriate measures to mitigate adverse impacts to the discovered resources. Cultural resource remains may include artifacts, shell, bone, features, altered soils, foundations, trash pits and privies, etc. If human remains are discovered, then the procedures described in Section 7050.5 of the California Health and Safety Code shall be followed. These procedures require notification of the coroner. If the coroner determines that the remains are those of Native American ancestry, then the Native American Heritage Commission (NAHC) must be notified by phone within 24 hours. Sections 5097.94 and 5097.98 of the Public Resources Code, describe the procedures to be followed after the notification of the NAHC.

## Bibliography

- Anon 1996 Cultural Resources Investigation Pacific Pipeline Emdio Route. Report (LA44088) on file at the South Central Coastal Information Center, Department of Anthropology, California State University, Fullerton.
- Bean, Lowell John, and Charles R. Smith 1978 Serrano. In Handbook of North American Indians, Volume 8, California, edited by Robert F. Heizer, pp. 570-574. Smithsonian Institution.
- Blackburn, Thomas, and Lowell John Bean 1978 Kitaneumuk. In Handbook of North American Indians, Volume 8, California, edited by Robert F. Heizer, pp. 564-569. Smithsonian Institution.

• Avenue K West; 27th Street; residential development (including 2707-2747 Avenue K West); Eliopoulos Drive; more residential development; 30th Street (western terminus).

Proceeding east along Avenue on the south side of the road: Open lot with a bus stop; residential development with brick wall fronting Avenue K; 27th Street West; residential development (including 2358-2330 Avenue K West); open lot; Westfield Drive and gated residential community; open field; 22nd Street West; Kinder Care; Pinecrest School; shopping mall (Albertsons and Savon, etc.); Jack-in-the-Box; Green Burrito; 20th Street West; Arco gas station; Pinnacle Mortgage; auto parts; residential development (including 1816-1802 Avenue K West; 25th Street West); 18th Street West; Chevron gas station; abandoned structure; open lot; Der Wiener schnitzel; Village Square; 17th Street West; Carrows; Motel 6; Highway 14 on-ramp and overpass.

#### Eastern portion of the project

Proceeding east along Avenue K on the south side of the road: Highway landscaping; 15th Street West; Freeway off-ramp; Arco mini-mart; Ross for Less; Big 5; 13th Street West; Krage Auto Parts; Sees Candy; Ralphs; Pic N Save; McDonalds; 12th Street West; Washington Mutual; Don Cuco's; target; Walden Books; Band of America; open lot; 10th Street West; Christmas tree lot; large, asphalt parking lot; open lot; Bingo Parlor; Gadsden Avenue; Woodcreek garden Apartments; open lot at 500 West Avenue K; Furniture place; Sierra Highway; railroad tracks; open lot; Division Street; open lot; Dallas' Trees; open lot; BPO Elks #1625; Antelope Town Homes (apartments); Kirkland Avenue; Antelope Town Homes; golf driving range (Lancaster Golf Center); 5th Street East; Alta Dena Dairy Express market; open lot; 6th Street East; Liquor market; open lot; abandoned building; 634 East Avenue K (residence); Lilliput Nursery School; residential development (including 646 East Avenue K); 7th Street East; residential development (including 714 and 720 East Avenue K); catch basin; 750 East Avenue K (residence); open lot; 790 and 806 East Avenue K (residences); Olympia Plaza; Challenger Way; Springfield Plaza; residential development; 11th Street East; residential development; open lot; residential development; private road; residential development; Yaffa Street; residential development; Carol Drive; residential development with a brick wall fronting Avenue K East; 15th Street East; residential development called the Le Palais (just graded land and brick wall); 20th Street East; open lot; residential development with a brick wall fronting Avenue K East; open lot; residence (2300 East Avenue K); open space; residence (2516 East Avenue K); brick wall; residence; Iglesia church at 2548 Avenue K East; open lot where historic remains are visible in the distance from the road (CA-LAN-1527H); 30 Street East.

Proceeding west along Avenue K on the north side of the road: Residential development; Santa Rosa Circle; residential development (2757-2727 Avenue K East); 27th Street East; parking lot; residential development with a brick wall and sidewalk fronting Avenue K East; 25th Street East; residential development with a brick wall and sidewalk fronting Avenue K East; 22nd Street East; open lot with a dirt shoulder; 20th Street East; residential development with a paved road and landscaping paralleling Avenue K East; Standcliff Avenue; residential development with a paved road and pine trees and landscaping paralleling Avenue K East; 17th Street East; residential development with a paved road and landscaping paralleling Avenue K East; residential development with brick wall fronting Avenue K East; gated residential development; Christmas Tree lot; 15th Street East; residential development with brick wall fronting Avenue K East; 13th Street East; residential development with brick wall fronting Avenue K East; Yaffa Street;

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- 1975 King, Chester D.
- 1998 Archaeological Reconnaissance for the 10th Street West Transmission Main Lancaster, Los Angeles County, California. Report (LA4392) on file at the South Central Coastal Information Center, Department of Anthropology, California State University, Fullerton.
- 1925 Kroeber, A.L.
- 1925 Handbook of the Indians of California. Bureau of American Ethnology, Bulletin 78. Smithsonian Institution, Washington.
- Love, Bruce
- 1988 Archaeological Overview of 508 Acres on the East Side of Lancaster Known as GPA 88-04 and 88-09, Lancaster, California. Report (LA249) on file at the South Central Coastal Information Center, Department of Anthropology, California State University, Fullerton.
- Love, Bruce, and William H. De Witt
- 1990a Cultural Resource Evaluation for Lancaster EIR Group 9, Lancaster, California. Report (LA2055) on file at the South Central Coastal Information Center, Department of Anthropology, California State University, Fullerton.
- 1990b Final Report of the Phase II Testing and Evaluation of GPA 88-04 and 88-09, Lancaster, California. Report (LA2088) on file at the South Central Coastal Information Center, Department of Anthropology, California State University, Fullerton.
- Manley, William R.
- 1990 Historical and Architectural Assessment of LAN-1526H, City of Lancaster, California. Report (LA1990) on file at the South Central Coastal Information Center, Department of Anthropology, California State University, Fullerton.
- Norwood, Richard H.
- 1989a Cultural Resource Survey for GPA-88-48, Lancaster, California. Report (LA1761) on file at the South Central Coastal Information Center, Department of Anthropology, California State University, Fullerton.
- 1989b Cultural Resource Survey for GPA-88-29, Lancaster, California. Report (LA1763) on file at the South Central Coastal Information Center, Department of Anthropology, California State University, Fullerton.
- Stickel, E. Gary, and Lois J. Weinman-Roberts
- 1980 An Overview of the Cultural Resources of the Western Mojave. Bureau of Land Management, Cultural Resources Publication Anthropology-History, Riverside, California.

## APPENDIX A

South Central Coastal Information Center  
*California Historical Resources Information System*  
California State University, Fullerton  
Department of Anthropology  
P.O. Box 6846  
800 North State College Boulevard  
Fullerton, California 92834-6846  
Phone: 714-278-5395 - Fax: 714-278-5542  
Website: [anthro.fullerton.edu/secic.html](http://anthro.fullerton.edu/secic.html)  
(Prepared by Esther Won on December 18, 2000 - Invoice #9074)

## HISTORIC RESOURCES:

No historic archaeological sites have been identified within your radius of the project area.

## PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS:

Three studies have been conducted within your radius of the project area. There are two additional investigations located on the Lancaster West 7.5' USGS quadrangle and are potentially within your radius of the project area. These reports are not mapped due to insufficient locational information.

Please forward a copy of any reports resulting from this project to our office as soon as possible. Due to the sensitive nature of site location data, we ask that you do not include record search maps in your report. If you have any questions regarding the results presented herein, please feel free to contact our office at (714) 278-5395.

Invoices are mailed approximately two weeks after records searches are completed. This enables your firm to request further information under the same invoice number. Please reference the invoice number listed below when making inquiries. Requests made after invoicing will result in the preparation of a separate invoice with a \$15.00 handling fee.

Sincerely,



Esther Won  
Staff Archaeologist

Enclosures:

( )	Primary Number Explanation
(X)	Map - Lancaster East, Lancaster West 7.5' USGS Quadrangle
(X)	Bibliography - _____ pages
( )	Site list - _____ pages
( )	HRI - _____ pages
( )	National Register Status Codes - 4 pages
(X)	Site records - 19-001526 (16pgs), 19-001527 (6pgs)
(X)	Survey reports - LA4392 (18pgs)
(X)	Confidentiality Form
( )	Invoice # 9074

**NATIVE AMERICAN HERITAGE COMMISSION**

915 CAPITOL MALL, ROOM 364  
SACRAMENTO, CA 95814  
(916) 653-6251  
Fax (916) 657-5390  
Web Site [www.nahc.ca.gov](http://www.nahc.ca.gov)  
e-mail: [de\\_nahc@pacbell.net](mailto:de_nahc@pacbell.net)

April 14, 2008

Mr. Michael Ignatius, P.E.  
Los Angeles County Department of Public Works, Waterworks Division

Sent by FAX to: 626-300-3385  
Number of Pages: 2

Re: Request for a Sacred Lands File records search for the proposed Avenue K Transmission  
Water Main, Phases I-IV Project located in Los Angeles County, California

Dear Mr. Ignatius:

The Native American Heritage Commission was able to perform a record search of its Sacred Lands File (SLF) for the affected project area. The SLF failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the Sacred Lands File does not guarantee the absence of cultural resources in any project area. This project site is in close proximity to previously discovered prehistoric burial sites and is believed to hold numerous cultural resources.

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Enclosed is the name of the nearest tribes that may have knowledge of cultural resources in the project area. A list of Native American contacts is attached to assist you. It is advisable to contact the persons listed, if they cannot supply you with specific information about the impact on cultural resources, they may be able to refer you to another tribe or person knowledgeable of the cultural resources in or near the affected project area.

Lack of surface evidence of archaeological resources does not preclude the existence of archaeological resources. Lead agencies should consider avoidance, as defined in Section 15370 of the California Environmental Quality Act (CEQA) when significant cultural resources could be affected by a project. Also, Public Resources Code Section 15064.5(f) and Section 15097.98 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archaeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a dedicated cemetery. Discussion of these should be included in your environmental documents, as appropriate.

If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,  
Dave Singleton, Program Analyst  
Attachment: Native American Contact List





**Native American Contacts  
Los Angeles County  
April 14, 2008**

LA City/County Native American Indian Comm  
Ron Andrade, Director  
3175 West 6th Street, Rm. 403  
Los Angeles, CA 90020  
(213) 351-5324  
(213) 386-3995 FAX  
Gabrielino/Tongva Council / Gabrielino Tongva Nation  
Sam Dunlap, Tribal Secretary  
761 Terminal Street, Bldg 1, 2nd floor  
Los Angeles, CA 90021  
office@tongvatribu.net  
(213) 489-5001 - Office  
(909) 262-9351 - cell  
(213) 489-5002 Fax

T'At Society  
Cindi Alvirte  
6515 E. Seaside Walk, #C  
Long Beach, CA 90803  
calvirte@yahoo.com  
(714) 504-2468 Cell  
Gabrielino  
Robert Dorame, Tribal Chair/Cultural Resources  
6450 Slauson, Ave, Suite 151 PMB  
Culver City, CA 90230  
gtongva@verizon.net  
562-761-6417 - voice  
562-925-7989 - fax  
Tongva Ancestral Territorial Tribal Nation  
John Tommy Rosas, Tribal Admin.  
tattniaw@gmail.com  
310-570-6567  
Gabrielino Tongva

Gabrieleno/Tongva San Gabriel Band of Mission  
Anthony Morales, Chairperson  
PO Box 693  
San Gabriel, CA 91778  
ChiefRBWife@aol.com  
(626) 286-1632  
(626) 286-1758 - Home  
(626) 286-1262 Fax

This list is current only as of the date of this document

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5087.98 of the Public Resources Code.  
This list is only applicable for contacting Local Native American with regard to cultural resources for the proposed, Avenue K Transmission Water Main, Phases I - IV, Los Angeles County, California for which a Sacred Lands File search and Native American Contacts list were requested.